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ENTERED AT THE POST OFFICE AT NEW YORK, N. Y., AS SECOND-CLASS MATTER.

[OFFICIAL NOTICE.]

Fourth Annual Meeting, Canadian Gas Association.

CANADIAN GAS ASSOCIATION,
OFFICE OF THE SECRETARY,
HAMILTON, ONT., June 1st. 1911.

The Canadian Gas Association will hold its Fourth Annual Meeting in the City Hall, Quebec, on Thursday, Friday and Saturday, 15th, 16th and 17th, June.

The President, Mr. Arthur Hewitt, General Manager, Consumers Gas Company, Toronto, will call the meeting to order at 10 A.M., on Thursday. After the Minutes, Executive Committee Report, and the Secretary-Treasurer's Report, etc., have been disposed of, the President will address the meeting. Thereafter the following papers will be read and discussed:

"Increasing the Efficiency of a Water Gas Plant," by Mr. J. S. Haug, Montreal Light, Heat and Power Company.

"What We Are Doing to Meet Our Latest Competitor," by Mr. W. J. Alston, Manager, Gas Appliance Company, London.

"Calorific *vs.* Candle Power Standards for City Gas: Should There be Two Standards or Only One?" by Mr. W. C. Philpotts, Chemist, Consumers Gas Company, Toronto.

"Operating Water Gas Sets," by Mr. R. A. Wallace, Quebec Light, Heat and Power Company.

"Merit or Points System as a Basis for the Remuneration of Commercial Representatives," by Mr. W. Kennedy, Commercial Department, Consumers Gas Company, Toronto.

Elaborate arrangements have been made for the entertainment of the members and friends by the Entertainment Committee, of which Mr. R. A. Wallace, Quebec, is Chairman.

On Thursday afternoon there will be an observation car tour through the city of Quebec. A visit will be made to the C. P. R. Atlantic Steamship, "Empress of Britain." In the evening the Band of the Quebec Cadets Corps will give a band concert on the Terrace by special arrangement.

On Friday a special car will be run to the famous shrine of St. Ann de Beaupre, stopping on the return trip at Montmorency Falls, where the guests will be entertained at dinner by the Quebec Railway, Light, Heat and Power Company. Dancing will be enjoyed in the evening.

On Saturday a visit will be made to the historic plains of Abraham and other places of interest. JOHN KEILLOR, Secretary.

BRIEFLY TOLD.

THE NEW YORK CONVENTION, NATIONAL ELECTRIC LIGHT ASSOCIATION.—The thirty-fourth convention of the National Electric Ligh Association, which was held at the Engineering Societies' Building, New York, from May 29th to June 2d, inclusive, broke all records for attendance, over 5,000 members and guests being registered. The meeting was made up of 16 sessions, divided between general, commercial, technical, accounting and power transmission, three paralell sessions being the rule. Numerically the commercial section sessions were the most attractive to the delegates, and although the smallest of the halls was allotted to the accounting sessions, this was not true of the attendance. In addition to the regular chapters a meeting of the Public Policy Committee was held at the New Theater, and there Mr. Samuel Insull read the set report of the Committee, which concerned the various forms of welfare-co-partnership and insurance work among employees. This was followed by an address by Hon. Charles

Nagle, Secretary of Commerce and Labor, who lauded the proposals of the Committee, claiming that the adoption of them would go a long way toward warding off unwise legislation. The entertainment features were quite as many and varied as the subjects discussed at the meeting, including as they did a theater party, reception and dance, two boat rides, and "teas," etc., for the ladies. The sessions were conducted in admirable method by Mr. W. W. Freeman, Vice-President of the Brooklyn Edison Company, and his alert aides, Messrs. J. L. Bailey, F. M. Tait and J. L. Gilchrist. Treasurer George H. Harries showed receipts of nearly $70,000 during the past year, which concrete statement gives some indication of the value of the work undertaken by this powerful organization. The questions which should be of interest to the gas fraternity included "Competitive Illuminants, "Ornamental Street Lighting," "Industrial Lighting," and "Uniform Accounting." Among the men present, who are more or less prominent at meetings of our Gas Associations, were Messrs. C. N. Stannard, W. C. Anderson, George Williams, F. W. Frueauff, R. M. Searle, J. B. Klump, W. H. Gardiner, Paul Doty, G. B. Cortelyou, W. C. Wardell, G. S. Barrows, N. Macbeth, J. L. Bailey, I. N. McCarter, H. B. McLean, E. H. Rosenquest, W. J. Clark, W. J. Barker, and a host of others.

National Commercial Gas Association, Philadelphia Section, May Meeting.—"The regular meeting of the Philadelphia Section, National Commercial Gas Association, was held Tuesday evening, May 23d, at 8 o'clock, in the United Gas Improvement Company's building, 1035 Market street. The meeting was called to order by Mr. C. G. Goeltz, President of the Section, with Secretary Bardsley recording. A number of amendments to the Constitution were presented, the most important of which was the following: "The name of this Association shall be the Philadelphia Gas Works' Section of the National Commercial Gas Association." About 75 members were present. The discussion of Mr. William O'Donnell's paper, entitled "Our Opportunities," read at the April meeting, was continued. The paper was discussed by Messrs. C. G. Goeltz, O'Donnell, Williams and others. The general concensus of opinion was that the paper was a very valuable one, especially to the gas salesman. Mr. James E. Lee, of the illuminating engineering staff of the New Business Department of the Philadelphia Gas Works, read an interesting paper on "Methods of Calculating Operating Costs of Lighting Installations." The author stated that, in a great many cases, everything was not taken into account in figuring the operating costs. The efficiency of the unit, the initial cost, the depreciation, and maintenance and economy of operation should all be considered. The efficiency of the unit is based on the mean spherical candle power, or in the case of electric lights, mean horizontal candle power times a factor 'per cent. spherical of mean horizontal candle power.' Methods of obtaining mean spherical candle power and lumens were gone into quite thoroughly. A great collection of data, including consumption, mean spherical candle power and efficiency of all the electric arcs was given. This not only covered the lamps which are on the market to-day, but also the older type of lamps. A number of lantern slides, showing different lighting installations, were discussed by Mr. Lee. These slides covered indoor and outdoor lighting of all different types. Questions were asked by Messrs. Goeltz and Anderson.—E."

Sounds Good to Us.—Mr. H. M. Byllesby, the clever gentleman who presides over the destinies of that well and favorably known corporation, Messrs. H. M. Byllesby & Co., of Chicago, which controls 35 gas and electric companies in the South and West, speaking last Friday at the New York convention of the National Electric Light Association, had no hesitancy in declaring that the better the public utilities companies are understood the greater will be the respect vouchsafed them by the people. "The tendency of the times," said Mr. Byllesby," is more and more towards a strict accountability in all corporate matters. The companies represented in this Association almost uniformly have done their part to aid in a better understanding between the public and themselves, and in loyally endeavoring to conform to the methods desired, granted only that along with the methods demanded by the spirit of the times, the corporations themselves receive adequate and proper protection. This being the attitude of all of us, and having acknowledged to the full last measure our errors of ignorance and our errors because we have been human, in the past, I think it is now obligatory upon the public, the press, the magazines, the lawmakers and the law administrators to come forward and co-operate with us to bring about a condition of far better feeling. I believe there is coming a condition of mutually better understanding than has existed in the past, and which will permit continuance of the rewards which are absolutely necessary to enable this business to proceed with its heretofore energy and enterprise—labor and capital—to enable these corporations to serve the public with an increasingly better class of service and in general a continual lowering scale of charges; although, of course, the lowering of charges cannot go forward indefinitely. If public service corporations are dealt with fairly, and are properly protected, I am confident they will continue to do their part. In this fair dealing and in this protection a very necessary feature is that there shall be on the part of the public, and the organic channels through which the public expresses its opinion, a proper appreciation of the enormous service rendered by the public service corporations; a proper protection extended to them, and through profit sharing stock or increasing return upon the capital invested, a reward provided which will justify the corporations in continuing to extend into thin and non-paying fields. Rates charged for service should be sufficient to enable the corporations, while paying the proper rate of wage for the high class labor they require, to provide for their employees when suffering from accident; to begin at least provision for old age, retiring payments as rewards for faithful and continuous service, and to do all those things which the advancement of civilization requires should be done in equalizing the rewards of capital and labor and in producing a condition of better understanding between employer and employee." The speaker also urged the greatest of care in the appraisals of public utility plants for rate making purposes, pointing out that the estimates of engineers for the construction of new enterprises had been generally far below the actual cost of the work; in some cases as much as 100 per cent. He contended that, if engineers err in their estimates prior to construction, they are subject to error also in estimating the cost of completed work.

CURRENT MENTION—

The Journal for the 22d ult. (p. 1003) had a line or two to the effect that Mr. E. L. Rieha, of Baltimore, Md., had been engaged as Consulting Engineer for the Baltimore Utilities Company, in respect of the construction by that corporation of a coal gas plant at Bluefield, W. Va. The real fact is that Mr. Rieha is acting as Construction Engineer in the erection of a gas plant for the Bluefield (W.Va.) Gas and Power Company, which property is owned and is to be operated by the Baltimore Utilities Company, of which corporation Mr. L. J. Pollitt is Engineer and General Manager.

Write to the Humphrey Company, of Kalamazoo, Mich, for a copy of its latest booklet, which bears date of the 1st prox., and carries the title of "Humphrey Herald." Of course, it has mainly to do with a description of the Humphrey gas water heater, which useful device is finding more favor in its particular field as the days slip into weeks. And that is saying much, for its merits have been well and duly recognized since its initial appearance on the market some years ago. The story of its success is well told in the May issue of the "Herald," which the publishers assure us will in the future appear regularly at intervals of 6 weeks.

Mr. W. P. Hutchinson, who has since 1906 represented the Sprague Meter Company in the Middle-West, has been appointed the Company's Sales' Manager, which position was created for him. Mr. Hutchinson assumed his new duties the 1st inst.

Governor Foss, of Massachusetts, has signed the bill which directs that all gas, electric light and power companies using cash recording meters shall be responsible for the loss by fire of cash deposited in said meters.

Mr. Frank H. Cutshall has been appointed to the position on the staff of the Indiana Lighting Company, made vacant by the death of Mr. John Neely.

The W. F. Boardman Company, through Attorneys Nolan and Game, has applied to the Klamath Falls (Oregon) Council, for the right to construct and operate a gas plant in the place named. A 50-year franchise is prayed for, and it is asserted that a plant will be constructed within 4 months after the granting of the petition. They estimate the cost of the installation at $65,000.

The authorities of Barton Heights, Va., are asking for proposals for the construction there of a complete gas plant. The bids or terms on which the various bidders offer to make the installation must be in hand by 6 P.M. of June 9th. Meanwhile the Town Clerk (Mr. L. T. Webster) can be applied to for particulars.

Office Building of the Schenectady (N. Y.) Gas and Electric Company.

Through the courtesy of Mr. M. Webb Offutt, General Manager of the named corporation, we are enabled to present the following de scription of the Company's handsome office home:

The Schenectady Illuminating Company and the Mohawk Gas Company, of Schenectady, N.Y., some time ago constructed a handsome building designed to meet the requirements of both companies from the business and commercial standpoint. The building (shown in Fig. 1) stands at the corner of State and Barrett streets, and occupies 80 by 125 feet of ground area.

The ground floor is used for general offices and display room, the basement for the demonstrating of special appliances, and it also has a large meeting room.

The display room and offices on the ground floor are shown in Figs. 2 and 3, being respectively night and day views. The lighting

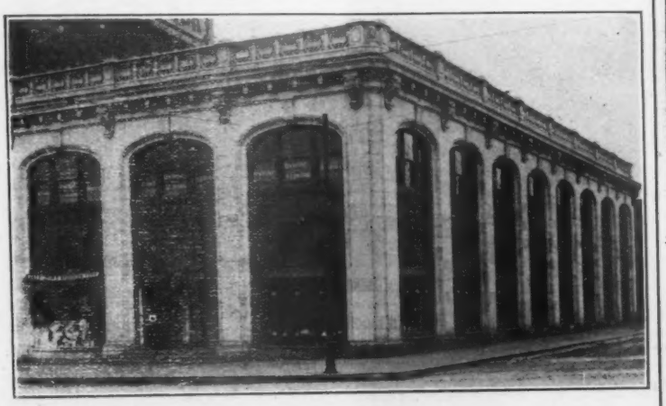

Fig. 1.—Exterior.

Fig. 2.—Interior, Night View.

installation is made up of the types of lamps which have been pushed successfully by the named Companies. For general lighting four, 100-watt Mazda lamps, and one 5-mantle Humphrey gas arc, are placed in each panel and Welsbach reflex lamps are used for bracket lighting. These fixtures are shown in Fig. 3, the photo of which was taken during the annual March discount sale of gas ranges, a carload of these being shown in the foreground.

The Gas and Electric Company uses the show windows alternately, and a typical illustration of each class is shown in Figs. 4 and 5. The displays in the show window are changed weekly. The building is supplied with hot water by means of an automatic storage water heater which heater and its connections are shown in Fig. 6. The Companies have been persistent advocates of educational work among the employees, and regular fortnightly meetings are held. A flashlight taken during one of these meetings is reproduced in Fig. 7.

Fig. 3.—Interior, Day View.

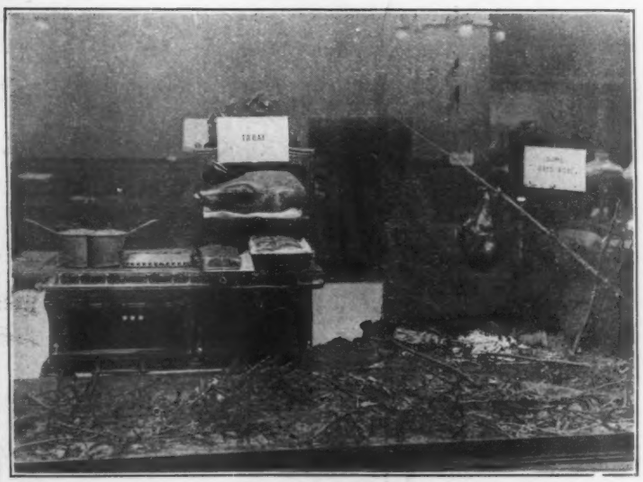

Fig. 4.—Show Window. A Gas Display.

Fig. 5.—Show Window. An Electric Display.

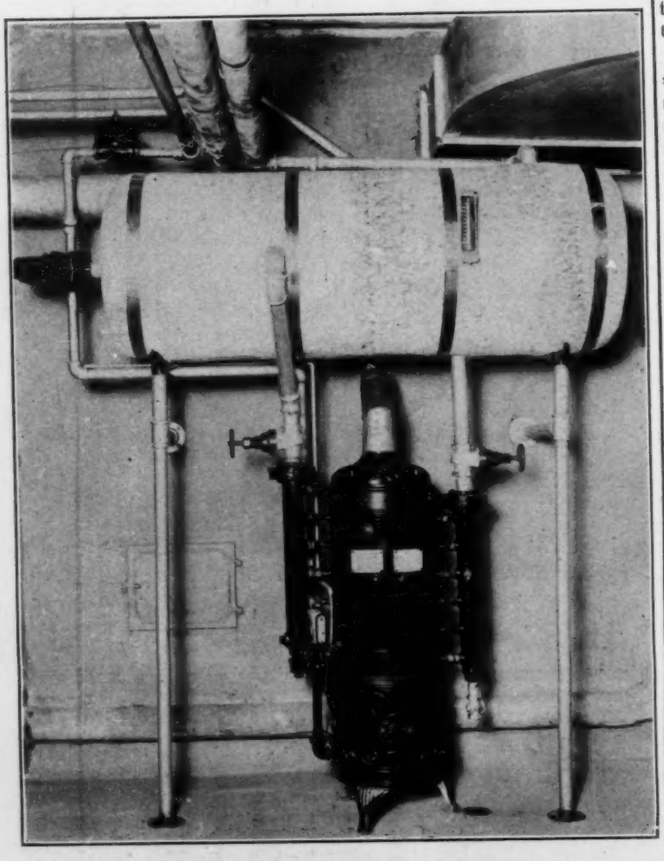

Fig. 6.—Automatic Gas Water Heater.

Fig. 7.—Meeting Night.

[Official Report, as Furnished by the Secretary.—Continued from Page 1049.]

PROCEEDINGS, SEVENTH ANNUAL MEETING, ILLINOIS GAS ASSOCIATION.

Held in the Auditorium Hotel, Chicago, March 15 and 16, 1911.

Second Day—Morning Session.

The President—Next in order of business is the paper on the

PREVENTION OF ACCIDENTS,

by Mr. N. D. McPhail, of Aurora, Ills.

The introduction of machinery into modern lines of employment brought many risks and hazards. At first little attention was given to the fact, many manufacturers attributing the increased number of accidents to the increased output; but time proved this a false view, as additional accidents meant an outlay for repairs and damages for killed or injured workmen, and a decrease in production owing to the fact that the spirit of the workmen was affected, thereby reducing their efficiency and interest.

Once these conditions became apparent to the manufacturers they set about to correct them. At first they aimed to prevent accidents recurring; now they aim to prevent the first accident. Numerous methods have been tried with varying results, but the improvement in general conditions is marked, the loss of life and the destruction of property being greatly reduced. What can be done in the gas business to reduce the number of accidents? There is no doubt that we take all ordinary precautions to prevent accidents; but accidents have happened and will happen again. What we most want to do is to devise a system by which improper and dangerous conditions can be brought to our attention and rules established by which these conditions can be improved.

Let us make a study of the accidents which have occurred and from these compile a set of rules that will prevent accidents occurring more than once; and if we have no record of the accidents that have occurred during the past few years, the best thing that can possibly be done is to have a record prepared, and these accidents thoroughly discussed with the different managers and superintendents, and a set of rules prepared that will overcome the liability of these accidents recurring. If a certain piece of machinery had been the cause of an accident, the men should be gathered together to devise something to improve conditions so that an accident of a similar nature would not occur again.

In this way we would make an accident committee out of the superintendents and foremen employed by the company. We would train them especially to use forethought and judgment, and not ask our employees to work where there is any danger through loss of life or destruction of property. Sometimes, however, there are cases where it is absolutely necessary that a man should assume some risk. In cases of this kind the employee should be given every possible safeguard known to the gas fraternity and be given every assistance possible in the way of help. He should be provided with the very best of tools, and a respirator, and in cases where a respirator cannot be used, he should have an oxygen helmet, and should never be allowed to work in a dangerous position alone, but should, at all times, have with him another employee who understands thoroughly the action of the gas and exactly what to do in the case the operator should be overcome. This information taught him at the meetings of these committees would do a great deal to reduce the number of accidents now occurring.

Accidents can be divided into two classes; those to life and to property. And these again should be subdivided: First, accidents to the life of our employees and to the public; second, accidents to the property of the company and of the public. In order to protect fully the life and property of both it is well to have a clearly defined set of rules drawn up to govern the actions of our employees and protect the public.

We are responsible to the public for their safety, inasmuch as we sell them an explosive commodity. They must be taught that gas when properly used is a great convenience, but when improperly used is very dangerous. A set of rules should be given to each customer who makes application for gas, so that, in case certain conditions arise where accidents may occur, they can consult the rules and know exactly what to do under the conditions.

The fact of the matter is gas consumers are so interested in their own safety that this set of rules would be memorized by every consumer on the mains. If these could be impressed upon the mind of the consumer such things as accidents from gas explosions of many kinds would be unknown. We get out a set of rules governing the conditions under which a meter will be set, how bills are collected, etc., but what gas company hands a consumer a set of rules as to what to do in case an accident occurs?

Further, we must protect our customers in the appliances we sell them, for very few gas users know the strong and weak points of appliances which they purchase. They cannot see whether an appliance is safe or unsafe. We must sell appliances that will insure them the greatest measure of safety, connecting these appliances in such way that there is no danger of an accident occurring from a leak or from defective workmanship. In order to assure ourselves that connections are being made in this way no connection should be made that will not stand the pressure test. We should also insist on an inspection of all piping before making a meter connection. For example, a house may have used gas for years, the piping having been tested and found in good condition, yet something may have occurred that caused that piping to leak. Before the meter is set a

test should be made, and if the piping is not found absolutely tight we should refuse to connect the meter. This has been done in several cases and the customer, after the matter had been explained, was thoroughly satisfied and instructed the company to repair the damaged piping at once and then make the connection.

We should also refuse to make other than solid pipe connections, as a large percentage of the accidents occurring to the public can be traced to the use of insecure hose connections. Gas hose should be sold only for the purpose of connecting reading lamps, flat irons, and gas heaters, but every one of these gas appliances should have no valve, thereby compelling the customer to turn off the gas at the fixture, thus preventing the pressure being left on the hose.

In case it is necessary, at any time, to discontinue the supply of gas on certain streets, the customers on that certain line should be notified that gas will be shut off for a given length of time, and they in turn should be asked to see that the gas has been turned off at all openings and appliances. Then as soon as the connection is again made the customers should be notified that the gas has been turned on. In this way possible accidents caused by the discontinuation of service will be prevented.

Another cause of accidents in certain classes of buildings is the prepayment meter. We are especially anxious to increase our sales and develop our business, and in so doing have found an instrument that suits our purpose admirably, by allowing us to reach a class of customers whose credit is so poor we could not accept the account with a regular meter. Special instructions should be issued every time one of these meters is put into use, calling attention to the fact that care should be used in the handling of gas through a prepayment meter, as the supply is liable to be shut off at any time, or before another coin is placed in the meter, the consumer should see that all gas jets and appliances are shut off, thereby preventing any possible chance of an accident occurring.

In addition to the safeguarding of the lives of our customers, it is also necessary to protect their property. All openings made in the streets should be properly protected, by danger signals during the day and by red lanterns during the night, to prevent accidents arising from an open ditch. All excavations made in the busy thoroughfares or the downtown streets should be protected by railings running completely around the excavation. All service pipes laid should be thoroughly inspected for leaks, and all stub services should be thoroughly tested before being capped and covered up. In addition, it is necessary that leakage gangs be kept continuously at work upon the streets to determine any escape of gas, not only to account for the loss of gas, but on account of the damage done to trees, shrubs and vegetation by such leaks.

Our next care should be that of our own property. The gravest danger naturally arising around a gas works or gas main is from fire; still some gas works use the old gas torch in parts of their works. It would be well to discontinue this, using electric lamps with vapor-proof sockets, with a switch outside of the building, so that in case any serious accident occurred the lights can be turned on without the employees endangering themselves in any way. In case of gas having escaped through the works, and one of these lamps exploding, the socket is still an absolute protection and there would be no danger from fire.

No matches should be used anywhere around a works, but if it is absolutely necessary that matches should be used, nothing less reliable than a safety match should be allowed; and if there should be a frequent use for light a vesta battery could be used, thus doing away with that danger.

In addition to these safeguards it is well to have fire extinguishers easy of access in every part of the works. These fire extinguishers should be taken out and examined periodically, say at least every month, and the chemicals contained therein reduced to a fine powder. If possible, a complete fire protective system should be installed in the works and be under easy control so as to be convenient in time of fire.

All holders and relief holders should be equipped with signal systems so that the height of the holder may be ascertained at any time without difficulty. The relief holder should be equipped so that an electric gong or steam whistle would warn the foreman that the holder was low a considerable time before the crown would cave in. In cases of leaks around the works, men should never be allowed to look for a leak by fire. Soap and water are equally effective in locating leaks and have the advantage of being absolutely safe. This would also apply to men doing gas fitting.

The protection of the life of our employees is rather a difficult matter. The force of any gas company is made up of a large body of employees, each working more or less independently of the other, and no set of rules can be devised that will govern the conditions as they exist in every situation. We have to warn employees, give them all the instruction possible, be very definite in requiring them to use extreme care, and then leave them to their own resources, they, of course, being cautioned that they must follow religiously the general rules laid down. We must equip these employees with good tools and the means whereby they can keep them in good shape, and we must expect them to obey instructions. In addition to this, if we should have an accident committee to whom all employees could make reports of accidents that occurred and of all the accidents that they anticipate, with the rules followed and the committee working vigorously, many accidents that might occur could be prevented.

As to protecting our works more thoroughly from accident, it would be well for the general manager of a company to require a monthly inspection report from the superintendent of works, over his signature. The report would be similar to the following, and you can readily see the effect it would have on insuring perfect inspection and cause the men to observe carefully the condition of all apparatus in and about the works.

1. How many feet of good fire hose have you?
2. Rubber lined, or linen?
3. When was it last used?
4. In what condition was it?
5. Where and how is it kept?
6. Have you examined connections, couplings and nozzles, and is hose ready for immediate service for the prevention of fire?
7. Do you require any more, and how much?
8. How many wet fire extinguishers have you?
9. Where are they located?
10. When were they last inspected?
11. How many dry fire extinguishers have you?
12. Where are they located?
13. Are they hung on stout supports so as to be easily pulled open?
14. When was the powder last examined to see that it is not caked?
15. How many water barrels have you?
16. Are they all full?
17. Where are they located?
18. Are buckets hung conveniently?
19. How many?
20. How far is the nearest fire alarm box?
21. Have you a key, and where is it hung?
22. Have you any other safety devices? Describe fully.
23. Is purifying house kept locked at all times when not doing work there?
24. Where is the key kept?
25. When men are working there, are unauthorized workmen kept away?
26. Are all windows in the purifying house sound? If not, how many are broken?
27. Is works regularly inspected at night, and by whom?
28. Are anti-smoking notices posted, and where?
29. Are electric lights in purifying house protected by safety globes and are all these in good condition?
30. When did you last look over the exposed electric wiring, and what defects, if any, existed?
31. Is the whistle attachment to all relief holders in good working condition?
32. At what point in its descent does the holder operate the whistle?
33. Your steam boilers are numbered from left to right; place after each number the pressure up to which you understand it is insured and the pressure at which you know the safety valve is set.
34. How many ladders have you at the works?
35. When were they inspected?
36. Are all stairs, floorings and railings in good condition?
37. When were they last inspected?
38. Do you use a protected gauge glass?
39. What kind?
40. Are all tar wells protected by railings?
41. Have you a complete kit of tools?
42. If not, which tools are missing?
43. If tools are not in good shape, note those needing repairs and those needing replacements.
44. What provision have you made to get workmen out of purifying boxes should they be overcome when emptying boxes?

45. Are you supplied with sufficient locks to lock valves when cleaning boilers?

46. Do you always use them?

47. Are all windows above the first floor properly protected with bars?

48. How many elevators have you?

49. Are they thoroughly protected with railings and gates, and are all counterweights properly boxed in?

50. When men are using the diamond point for cutting pipe, do they use a shield to prevent flying chips from doing damage?

51. What provision have you made in order that gas will not be turned into a purifying box while same is being cleaned?

52. Do you make a careful inspection of all manhole covers before changing purifying boxes?

53. Do you allow the use of any matches around your works?

The filling out of this report would necessitate a very thorough inspection of the entire works by the superintendent, and he would at such time feel that the responsibility for any accident rested upon him. We could also, at the conclusion of the report, leave a space asking for any suggestions he could make that would improve the safety of conditions at his plant, and by this method in a short time the chances for accidents would be practically eliminated.

A report similar to this could be prepared and sent to the superintendent of the shop and fitting gang, also to the street superintendent, covering very carefully all cases where accidents are liable to occur in his work. This report, the same as the works superintendent's report, would require a thorough inspection and knowledge of what should be done to prevent accidents, and would keep the shop and street superintendents on the lookout at all times for any trouble that might arise.

Although all possible care is taken and all these reports are properly turned in, insuring a thorough inspection, accidents will unavoidably happen. Let us have an accident report giving all the details of the accident. Such a report as follows might be used, emphasizing the fact that we wish particular attention given to the cause of the accident, so that the same accident will not occur again:

ACCIDENT REPORT.—*For Managers and Superintendents.*

Date..... Time.....
Place.....
Cause.....
.....
.....
Nature of injury.....
Name of injured.....
Residence..... Occupation.....
By what department employed.....
Age..... Nationality.....
Names and residences of all witnesses.....
.....
Attending physicians.....

Instructions.—Visit scene of accident as soon as possible. Interview all persons who may know anything concerning same. Talk with injured person and get signed, written statement, if possible. In case of serious accident or injury have witnesses write statement if possible, in presence of witnesses. Get date and signature of witnesses to statements. If witnesses do not write statements, write them yourself, but get signatures. Do not use this form for witnesses' statements. Attach statements to form and send immediately to general manager.

In minor accidents or injuries, merely fill out blank, but do not get written statements of witnesses. Report all accidents or injuries or possible claims for damages. Use tact and judgment.

Now, having prepared these inspection and accident reports, each company should form an accident committee, consisting of the general manager and general superintendents. This committee should meet at least once a month, and go over very carefully all accident reports and all inspection reports received from the different superintendents during the month. Schemes should be devised whereby an accident that once occurred is not liable to recur, and all new dedevices for safeguarding our workmen should be brought before this committee and the recommendations of this committee should be accepted and acted upon by the company's management. A report of the proceedings of these meetings should be kept and distributed to all the workmen. They would see that an effort was being made to protect them in their work and would undoubtedly be more careful of themselves and of their fellow employees. Workmen should be encouraged to send suggestions to this accident committee, these suggestions to be discussed very freely and reports of the discussion returned to the different workmen.

Frequently, indeed, we can receive suggestions from manufacturers that will be of benefit to us. We might insert on all orders the following clause: "This Company is especially anxious to protect its workmen and any new devices brought out for that purpose should be brought to our attention and same will be given our consideration when the purchase is being made." This would secure for us the cooperation of all manufacturers who are experts in their line and qualified fully to furnish valuable help.

"This method of procedure, if taken by gas companies, will reduce the number of accidents to a minimum. Some system of inspection and inspection reports can be established in even the smallest plants, and where a number of workmen are employed accident committees can be organized with good results. Even the most limited inspection will prove profitable. It will bring inquiry and investigation, and wherever an error is found there will also be found reform and a striving for better things."

Before this subject is finished I wish to express publicly my thanks to Mr. Harrington, our President, and to Mr. J. P. Coghlan, of San Francisco, for the definite help and information I received from them in the preparation of the foregoing paper.

Discussion.

The President—Gentlemen, we have listened to a really live topic, which I am sure is of great interest. Some of the largest companies to day are sending their claim agents all over the country, the same as a company would send an engineer to investigate things. The larger companies are sending claim agents around to examine and obtain all the data they can to guard against accidents. I hope we will have a free discussion of this paper. I will call on Mr. Day to open the discussion.

Mr. Day—Mr. McPhail's paper is very timely and valuable, and, in making a few comments on the same, I will endeavor to follow the order in which they are taken up in the paper, prefacing them by saying that as I am in the Street and Meter Department of our Company (Chicago), my comments will be along street department lines. The idea of the tabulation of accidents is one that I heartily favor, and quite recently I made the suggestion to our Company that we start some such scheme. This tabulation could be extended, not only to accidents which cause damage to life and limb, but to occurrences which perhaps could not be classed as accidents. For instance, I recently heard of a man who, in zero weather, was manipulating two gas lines having a water gauge, watching the gauge for fluctuation, observed that the same remained stationery at about the figure he expected. He closed his valve and so shut off his line and put it out of business, to discover very shortly that his gauge was frozen. When I heard of this the thought came to me, here was a thing that might happen to anyone. Why not forewarn your men in this connection; and, further, why is it not possible for gas companies to exchange experiences along these lines? If someone would start a little pamphlet, called, for instance, "Gas Experiences," and put down that such a thing had happened in such a way, by this means I would have the benefit of your experience and you would have the benefit of mine, and we would each get a lot of new information that would cause us to say, "That might have happened to me; I will watch out for that." If this suggested arrangement, or any other, could be carried out, whereby we could exchange ideas with each other as to our experiences, I think it would be very valuable. In the matter of taking care of public safety, our Company goes to very considerable lengths. In our rules we reiterate and impress upon our men that matches shall not be used; that an inspection of all burners shall be made, before the gas is turned on, and after it is turned on. The rules specify that the helper shall not do it, but that the fitter shall, and the penalties for not making a complete test, both before and after, are most emphatically stated in the rules. We maintain emergency motor wagons for the protection of the public. They report to every fire and take care of a large quantity of our gas inspection orders, rendering a most quick and efficient service. In the matter of instructions to customers regarding appliances, it is my experience that we are constantly on the lookout, and we realize that oftentimes we must attempt to protect the public against itself. We have a standing committee that passes upon all types of appliances which we expect to sell, and before an appliance is accepted or placed on our floors for sale, this committee examines it with the idea particularly

in mind of the matter of safety, and they decide as to which are the safest and best appliances for the public use. The manufacturers work with them constantly to turn out improved appliances that are designed to cause practically no troubles to the public. Referring to the question of connection by hose, we do not connect anything except with iron pipe. I have already stated that we will not allow the use of matches for testing purposes. We insist upon a soapsuds test on all meter sets and pipe jobs. It is, of course, sometimes difficult to make adequate soapsuds test; but we do it. It, no doubt, is the safer plan. In addition to prohibiting the use of matches, we do not allow the use of candles or naked flames. Every fitter carries an electric lamp, furnished with a tungsten bulb, which gives him a fine light lasting some 40 hours or more. Several competent men take care of these lamps and we educate our fitters as to the care they should give the same. We make an inspection of lamps, both at the charging board and on the fitters' wagon, and get from the latter their experience with them, as to length of burning time and general conditions. Sometimes we find the fitters do not properly care for their lamps, so that same are not in working order when they expect to use them, and again we sometimes find the fault elsewhere. By getting to both the start and finish of the routine of handling the lamps we get first-class service from them. As to drills for first aid work, we had a special book compiled by our doctor which we furnish to every employee, and in it there are very concise, practical and simple instructions as to what to do in cases of trouble, particularly street troubles, resuscitations, etc. We bring into the doctor certain men whom we deem capable of imparting information to others, and these men are put through a practical course of first aid. After they are through with their instructions, they in turn instruct classes so thoroughly that every man above the grade of laborer is expected to know what to do for a man overcome with gas. One of the first instructions in the book is to get a doctor at once, but there are lots of places in the outlying districts where a doctor cannot be found. Then it is up to the service foreman or others to follow out the instructions he has been taught. For this service we furnish with every gang and fitters' wagon an emergency kit, containing 40 or 50 articles, including the means of opening a man's jaws and holding his tongue out by a tongue clip, with restoratives, bandages, etc. At our 4 shops in different parts of the city we maintain a room for first aid, so that if anyone is injured in that particular shop, or if anybody is brought in for treatment for a bad cut or wound, we are able to give them first aid, a specialist for first aid to the injured being always kept at the shop for that purpose. Of course, we are very careful not to attempt to step over the bounds of first aid; beyond this it is up to the doctor; but we are perfectly able to take care of minor injuries. We have a Company doctor in each part of the city, and in each shop and with each medicine kit the 'phone number of the nearest doctor, as well as our main office 'phone number, is put on a card, showing just what doctor to call when an accident occurs. At our shops we have fire drills, and in connection with these we use a report very much like the report given here. These reports come in the form of answers to a great many definite questions, and are turned in on the first of each month. We have a fire inspector at each of our shops, whose business it is to make his rounds through the shop both day and night, and he is held responsible for proper fire conditions. No oily waste or dirt is allowed to accumulate, fire doors are kept closed, lockers are examined and all fire apparatus kept in perfect order. To check up these inspectors a general inspector, working from my office, is in charge, who reports directly to me. This scheme has proved so successful that, although we employ the services of a fire inspection bureau, they find very little adverse comment to make on conditions at our shops. We have fire drills periodically; also unexpected fire drills. My head inspector walks in at any time of the day or night and pulls the fire alarm, and all responses must be made in a very short time. Every man is trained what to do in case of fire, and as the fire reports come to me personally I know he does it. The accident reports are made out as soon as it is possible to make them, whether the accident happens to an employee or to the public. Detailed reports are sent to my office, the doctor and the claim agent, and, in addition to this, we have shorter reports, which are sent to me whenever possible, at almost the moment an accident occurs. Or, if the accident is a serious one, I am telephoned at once. This special report places me in the position of having the information at first hand, so that I am always ready to answer any questions regarding an accident, if called upon. In connection with the matter of suggestions from employees, we have always had suggestion boxes in all departments, and some suggestions have been asked for and received which were very valuable. The idea was not original with us, for two or three large local business houses have done tremendous things with suggestion boxes, the idea being that the man actually doing the work is the man who can tell you how best it can be done. If you make it an object to that man, he will tell you; if you don't, he probably won't. A suggestion scheme in use by a large Eastern gas company provides an easy means of communication between the men wishing to make a suggestion, and a committee, who meet once a month to work over the suggestions made. The suggestion of greatest value, in their estimation, receives a graded monetary reward of $25, and so on down. We have never given a monetary reward, but I have made it my business to see that the one who made a suggestion got the Company's thanks for it, and in several cases obtained a reward indirectly. In all cases, however, I have intimated to the man making the suggestion that the employee who thinks for the Company is the man I am going to think about when I am looking for a bright, clever fellow for some particular job, and it is quite the rule that the man who takes enough interest in his work and the welfare of the Company to send in suggestions is the man we consider capable of earning a little more pay, and he generally gets it. It is not improbable that the Eastern scheme of monetary rewards may be adopted by this Company, although without it I have received a great many suggestions, and some of them mighty good ones. In conclusion, I would like to repeat that I think the paper is a very valuable one, and I am not taking any credit for the fact that quite a number of things suggested are being worked out in our Company. That doesn't lessen the paper's value one bit. I am very much interested to know that we are doing some of the things mentioned in the paper, and that there are quite a few items that we are not covering at present.

Mr. Stillson—The discussion of a paper such as the "Prevention of Accidents" is of importance only in that it gives weight to an important subject by added numbers participating. It is perhaps easier to emphasize some of the points mentioned in the discussion rather than add any real points of merit. Generally it is found that accidents of any nature around large plants can be prevented by only usual foresight and prevention of undue haste. A man, no matter how skilled he may be, is not fit for the directing of his fellow men unless he exhibits good judgment in the operating of tolls and men, and he should not be chosen for a position simply because he exhibits foresight in the economical construction or operation of equipment, but also because he has judgment of the amount of work that a man can do and of the manner in which he directs the work to be done. Many instances can be quoted, illustrating these points, but they are simply a statement of truth, therefore unnecessary. Careless and undue haste are two bad attributes for a company or man to foster. It is much better to take a little more time to prepare a scaffolding, to properly erect auxiliary apparatus, and to call men away from a dangerous point, during the lifting of a heavy load, for the time lost is only a small amount in the long run, and the workmen appreciate such methods as these and will work faster and more willingly, where they know the foreman, for whom they are working, is looking out for their safety. The point mentioned in the first paragraph of the paper is only too true, that carelessness and haste reduce the efficiency and interest of the workmen. It is true that some trades are surrounded by greater danger than others, and for these trades foremen and men must be well fitted. Our business, as a whole, is not dangerous, for, though we handle what may be called a dangerous commodity, our methods have been so carefully regulated that accidents are rare. Our troubles chiefly occur through what was mentioned in the first part of the discussion, that, in our haste to make good results, we become careless. The superintendent or manager who is always urging and hurrying his foreman and men, encourages this very weakening point into the operation of his plant or distribution system. Lack of foresight by the distribution or manufacturing departments makes a great deal of trouble for the operating foreman and his men. Work is not laid out far enough ahead. Proper tools, scaffolding and the like are not prepared until the last minute, then the men are sent hither-and-thither for material, which the department heads should have already provided, and troubles begin to arise manifold. Take, for instance, in the manufacturing business alone, in gas and electricity, the daily operation of the plant can be put on such a basis that every man, if you please, "knows where he is at" at all times. Generators, engines, compressors, exhausters, elevators, etc., all have their proper and regular times of inspection. A set of rules may be prepared for the foremen of the stations or plants to forewarn of the time at which a repair is to be made and the danger thereof if the repair is not made at that time. Apparatus, which is

important and which is operating in the station for a period of 24 hours each day, must be in duplicate and wearable parts must be kept where they will not be lost, so that they may be had for repairs at any time. This will apply to everything in the nature of repairs, such as packing, bolts, stubs, valve repairs, in fact everything that has a short period of life and must be repaired at frequent intervals. For other apparatus, not in duplicate and which has an intermittent function to perform, repairs should be at hand as above stated. Special tools and wrenches used should not be allowed to stray to other parts of the plant or be loaned to firms and not returned. Too much cannot be said of having men, who are familiar with the strengths of materials, engineering difficult construction or large repair jobs about plants. How often do we read of accidents occurring; for instance in large plants, where a crane or cable has been overloaded or too much construction material has been placed on green, insecure or improperly laid floors. While it is not necessary to have an engineer in charge of a job to weigh and measure, he should be a man acquainted with the various weights that he is lifting and the strengths of the cables, by which he is raising these weights. Heavy tanks should be placed upon ample supports, so that they will not collapse in storms or when filled with water. Such accidents are to be remembered and can be prevented by the simplest kind of architecture. The construction of poor brick and steel work is entirely out of this range of discussion, only that we should see that men should not be allowed to put in a job who do not know how to calculate the necessary weights and loads. Poorly constructed brick buildings are seen many times in a gas or electric plant, due to one or two reasons: Either the engineer, who designed the building or the inspecting superintendent of the plant did not understand their business or did not look after same during construction. Apparatus in a gas or electric light plant is generally built upon the ground and few accidents occur on account of the failure of foundations, but at times heavy tanks aloft or high towers collapse during storms and simply illustrate cases of poor engineering. In electrical plants how many times do we see great belts and rapidly revolving flywheels not adequately protected from visitors or workmen? There are some instances of flywheels disintegrating, due to too great peripheral velocity. Belt accidents are frequent and thus the dangerous area about a belt or flywheel should be railed off. There is little danger of visitors or unauthorized persons getting injured around a plant, but all large plants have a railing or visitors' gallery, back of which no unauthorized persons are allowed to go. The green workmen may come in contact with the dangerous points on the switchboard, and for that reason they should be labelled front and back, and not be touched except by men who understand the handling of such apparatus. Not only is there a loss of property and service, but in many instances a loss of life as well from careless handling of the switchboard apparatus. Auxiliary apparatus in a generating or transforming station is too often tucked away in dangerous places. Properly designed plants will care for these auxiliaries, and see that they are isolated or protected in the best way. In the care of large engines and generators too much cannot be said towards instructing the engineers and their helpers how to oil and grease bearings, how to stop and start engines, and of the proper care of the generators and auxiliaries. Large valves should be placed in accessible places, particularly those which might be called upon to be operated in case of an emergency. The boiler feed pumps and water supply pumps must also be placed where they can be repaired and examined readily. Often expensive apparatus around a plant needs constant attention and frequent and regular overhauling. The pumps and boiler being, as you might say, the heart of the electric or gas plant, demand at all times constant supervision. Neither can be started in operation and expected to run constantly with much efficiency without constant attention. No matter how small the plant, rules and regulations must be provided. The part of both the electrical and gas plants, which makes or loses money for the company, and perhaps which is given as little attention as any part of the plant, is the boiler room. Too much is left to the boiler tender. The boiler, while perfectly safe, is within itself a delicate apparatus, for it requires frequent cleaning both inside and out. In a great many cases water is used which deposits a great amount of scale, and the analysis of the water must be resorted to so that you can introduce the proper amount of boiler compound or water solvent. Accidents frequently occur from trouble with gauge glasses, leaky steam valves and blow-off valves, and to prevent these they must be cleaned carefully. A boiler should be cleaned at least once a month and blown down at least every 12 or 24 hours, according to its load and the character of the water used. Careless work must not be tolerated by any of the men around the boiler room. Accidents are few, but serious, from boiler explosions and boiler accidents; particularly is this true in the case of the boilers, as, with all other apparatus, they are bound to wear out and grow defective in places and these defects must be noted before they give trouble. Cleanliness is next to Godliness and promotes safety. Insist that all plants are kept clean and deal summarily with the offenders of the plant's ordinances. Teach all men to feel a responsibility for the machinery, even though under the care of another man. Keep all strangers and familiar acquaintances on pleasure bent away from the premises. Frequently discuss with the foreman how to proceed in the case of a particular accident or with fires in various points. The paper dealt very completely with the equipment of the plant for fire protection. In a plant where a great number of people are employed, a fire drill periodically is absolutely necessary. This not only develops the action of the people in time of fire, but makes them less receptive to an alarm when a little accident or fire occurs. As system and rules must be used in the operation of a plant and machinery, so should the same system be applied to the hours worked and the time of regular duties of all men from the foreman down to the lowest paid man in the plant. The laboring man should be overworked no more than a well treated animal, and like the latter, the best of efficiency is gotten from them by regular working hours. You cannot expect men who labor to be particularly ambitious, and they are very much inclined to watch the clock. They must not be worked for 1, 2 or 3 hours' overtime on sudden notices, even though they are willing to do this, as it is the last and perhaps the darkest hours of the day that the largest number of accidents occur. System in all things is best. It is money saved in keeping old men at work, instructing new men about new jobs, who are unfamiliar with the work, and old men should be kept with them until they are thoroughly conversant with every step that is made. While it may mean a slight addition to the pay roll, in a great many cases it is only a small percentage of the loss due to an accident, which might occur to a new man and for which he cannot be held wholly responsible. The best regulated plants have what is known as a schedule of proceedings for all departments, in which the work of all the various machinery is carefully outlined and the men instructed in every possible step and emergency. Not only is this schedule adaptable to a large company, but is well adapted to any plant employing any number of men. The matters brought out in the paper of loss of life and property of the people outside of the corporation are very important. Where these accidents are liable to the negligence of an employee, these can be prevented as has been previously outlined. Gas and electric companies supply a commodity which in itself is dangerous, and when carried to the consumer endangers the lives and property of the people at large. To protect our customers they should be thoroughly informed, and we should no longer allow the current impression that we only know how to handle the business at hand, but we should teach consumers, as far as it is necessary, what they must expect and how to deport themselves in getting the benefit of the commodity with which we serve them. The operation of all appliances must be carefully explained, either by representative or by printed directions, and we should be careful to teach them how to proceed in cases of aecidents or emergencies, as well as our own men, and in such a manner not to frighten them and lessen the use of the commodity, but in a way that they know that we have their welfare at heart. This creates a more friendly spirit between customers and company. For instance, in the distribution department of both gas and electric companies, proper care must be shown for the people, whom we are serving, as well as those whom we discommode necessarily in the serving of their neighbors. This is good business policy as well as for safety. In case of a gas extension in a street, in which it is necessary to shut off the gas temporarily in a certain section, a time of day should be chosen which will discommode the smallest number of people, and, as stated, they should be notified. Perhaps none of our distribution work gives us as much trouble as the filling of excavations. To make us less liable to suits and promote the general welfare, the manager or superintendent should follow up these excavations and fillings to see that the work is taken care of after it is done. To prevent leakage, which is a costly inconvenience to ourselves always and to our customers sometimes, a systematic survey of mains should be made. It is not necessary to keep a gang of men constantly at work, but it does mean that we should be looking continuously for trouble. Large gas corporations have made particular note of the resuscitation of people overcome with gas. This is very important and should be taken up with all of the smaller companies.

No company is free from this accident, and in many cases companies at times will find it necessary to employ expert medical aid, and at times this expert is none too infallible when you have but a few seconds to save a human life. There is probably no man in the gas business who has not been asked to help resuscitate a man or woman partly overcome with gas, and thus it is necessary for all companies to have one or two men familiar with all the steps necessary to revive people in this condition. There are numerous pamphlets, all essentially of the same general design, which contain the proper methods and medicines to be used as first aid to the asphyxiated person, until the medical man has gotten to the scene of the accident. Too many times it has been found, even in a large town, that unless the company have a trained man in their employ, the medical man called would have been unable to save the life of the victim. Accidents cannot be too trivial to escape thorough investigation. Blood poisioning from a small wound is perhaps the most common of the serious accidents in our companies and this often, if taken at the proper interval of time, may be absolutely prevented. In a paper given by Mr. H. A. Johnson, Omaha, Neb., some dangers have been tabulated, and while they seem unimportant, their prohibition particularly around a plant, prevents many accidents. He has tabulated them as follows and none must be tolerated:

1. Men allowed to work with defective tools or defective ladders.
2. Slippery or weak floors.
3. Dark blocked passageways.
4. Defective elevator gates.
5. Material projecting out from a shelf or otherwise, which will inflict slight injuries.
6. Unguarded moving machinery parts.

This last is particularly one of the most dangerous elements around a gas or electric plant, and very often a rapidly revolving flywheel with a set screw, nut or key, catches upon loose garments, very quickly giving serious injuries and very often resulting in the loss of life. He brings out a point, which is particularly true, that some men, through their own carelessness, are constantly getting hurt or causing accidents to others. These men should not be kept in the employ of the company. A few things might be added to apply to the distribution department, which, while trival in themselves, very often lead to costly accidents to life and property. For instance, in tapping a main a perfect tool should be used, so that a perfect job can be made. A 4, 6 or 8-inch wrought iron main should be tapped to proper size, which will necessarily be the smallest orifice that will give a proper flow of gas. Thus the dangers from breakage of this main are partly eliminated. For mains of 4 inches or smaller it is a good policy to use a saddle and drill of ¼-inch for all ordinary services. To prevent unnecessary digging or stoppages, service and main pipes should be carefully laid. The proper size fittings should always be at hand and no rush jobs allowed. Materials should be handled according to a standard sketch, and never should material be connected to the piping of a house without meter test hand examination for at least 15 minutes with everything shut off. House piping and fixtures should stand a test of 6 pounds or 12 inches of mercury. All house piping must be drained back to the meter or to a house drip. All gas appliances, especially those installed in a cellar, should be placed in an open place and readily accessible for examination and free from danger from any combustibles being piled nearby. Our men should be taught that loquaciousnes is not particularly a good asset, although they should answer all questions civilly. The talkative fiitter always gets himself and the company into hot water, as in a great many instances he is asked questions which he cannot intelligently answer, and should refer the questioners to the proper authorities in the office. Telephone connections with men holding important positions with the plant should be installed, and teach these men as far as possible to have regular hours. In high pressure work it is particularly important that the distribution system be so arranged that a certain section of the town can be isolated without shutting off the entire district. This is done to facilitate repairs and the shutting off of the supply of gas in case of fires or accidents, which valves must have valve boxes, and valve keys must be in duplicate, one placed nearby, as is often done in the case of a fire alarm box, one or two extra keys being in the office. The pipe line must be gone over periodically to detect leaks and defective parts. The putting of the high pressure lock-cock in a box outside of wall has been investigated and has its merits, rather than having it inside the wall near the regulator and meter, as has heretofore been done. It is not well to depend too much on the so-called safety appliances in high pressure work, as we still have to depend largely upon reliable men, and it is of absolute importance that we use great care in construction work, as it is a heritage that we leave to others. The system of having complete rules applies only too well in this case.

The President—Mr. Day, have you something more to add to this discussion?

Mr. Day—I would like to correct the impression that we are committed to exposed housepiping. That is a mistake and should refer only to a stove run in an old building not previously piped for gas. In any new building, of course, the piping is always concealed whenever possible. We maintain a bureau of housepiping inspection, and the outside gasfitters' work in connection with that bureau, and follow our rules, running pipe according to size, etc. This bureau is maintained in the downtown office and the head thereof is constantly visited by architects and master gasfitters, who, having a large problem on their hands, come in to ascertain if, under our rules, any modifications can be made, and plan with our chief inspector just how the building shall be piped, where the risers shall be brought to and meters set, etc. During the process of piping, the inspectors from this bureau visit the job, and when completed according to our rules, an inspection certificate is issued and the riser tagged, showing the inspection has been made.

The President—Is there to be further discussion on this paper?

Mr. Negley—In this discussion there has been nothing said about liability insurance carried on employees and on the public as well. Possibly that did not come under its scope, but it would be a good thing if we all carried a little liability insurance, especially in smaller companies, where we find that the premium paid on our employees has been less than what it would cost to employ an attorney to defend our cases. While we never had any very heavy damage suits, we have had a few, and find that the liability company always takes care of our employees, usually paying the hospital and doctor's bills, and giving them straight time while they are off. In that way I think it helps our employees and creates a feeling among them that is better than if they are allowed to go on and pay their own expenses and lose their time.

Mr. Patterson—A word with regard to fire hose around the plant. One company with which I was connected had a special line of fire pipe. Each line of pipe, that is, for gas, water, steam, etc., was painted in its own color to identify it at all times, and this special line of fire pipe which we were not allowed to tap into to make a connection, except for fire purposes. They tried innumerable schemes, and finally solved the problem by having hose not over 15 feet long, but placed at sufficient intervals so as to take care of any fire. The object of having short lengths of hose was that they could be kept in such shape that they would not readily rot. It was found that long lengths of hose folded into short lengths would soon rot. The hose when not in use was kept in a semicircle up in the air out of the way, and thus kept from rotting, although, of course, it was inspected at certain periods. That seemed to take care of the proposition of fire around the works better than anything else they could get. As to instructions to the men, I was connected at a time with the distribution district. We had some 9 shops and employed 600 or 700 men. The shops were in charge of the district foreman. If I remember rightly, these instructions were read twice a week to all the fitters gathered in the shops before they started to work. That was compulsory. They did not have a very long set of rules, but they were concise and to the point, and covered the principal things that were liable to happen. In that way the instructions were thoroughly drilled into the men and, of course, the foremen watched to see that the rules were lived up to. There was one suggestion made by Mr. McPhail in regard to having the fitter ask the consumer to see that all burners were lit after the meter was set. Our men did not depend upon the consumer to do this, but were required to go through the house and light every burner, which prevented any possibility of an accident happening, barring the human element coming into play in the fitter not doing it. But in a majority of cases they did it. Also, before the meter was set the piping was tested under, I think, 10 pounds of regular pressure. This test was made without the fixtures in position. With fixtures in position, if I remember rightly, we required 6 inches of water pressure. We had a good many leaks and lost a good many thousand dollars in suits, and we adopted that system to protect us. As to reporting accidents, we report them the very instant they occur. One man has charge of that department. Originally he did a good deal of other work, being stenographer to the chief engineer; but he was required to drop everything and get out and take statements in regard to the matter and

have all the statements back in front of the engineer and the lawyer, if it were necessary to have a lawyer, just as quickly as he could. Of course, in case of accidents to employees the first instruction was to get a doctor as quickly as he possibly could. Mr. Day also spoke of giving the men instructions as to how to take care of a person in case of an accident. We also had that. We had our service squad in each shop completely fitted out and the men were given very thorough instructions as to how to take care of any accident that was liable to happen.

Mr. Reinicker—I would like to make a few suggestions concerning Babcock fire extinguishers. Since the pressure caused by the action of sulphuric acid on bicarbonate of soda is very high and generated very quickly, it is advisable that sufficient space be allowed in which the gas can momentarily accumulate, or the shell of the extinguisher may rupture and cause serious injury to the men operating it. In order to provide ample space for this gas, it is necessary to so fill the extinguisher that, when the bottle containing the sulphuric acid is placed in the water, the top of the water shall be at least 5 inches from the cellar around the top of the shell. It would be a very wise precaution to have a notice placed on the outside of each extinguisher, "Keep water 5 inches from cellar, when ready for service." Extinguishers should be recharged twice a year, and inspected once a month, and the soda stirred into the water, should any accumulate at the bottom. By these inspections you can be reasonably sure of your extinguishers should the necessity arise to warrant their use. The care of fire hose is another very important consideration. One of the greatest detriments to the life of hose is in the fact that any accumulated water, or even dampness, tends to rot it, and the result can be easily imagined when service pressure is put upon the line. In order to carry off any water that might accumulate, due to leaky valves, etc., it is advisable to put a drain on the hose line side of the valve, and at its connection to the standpipe. In order to overcome dampness due to sweating, it is well to thoroughly dry out each line of hose every week, by suspending it and allowing it to remain all day. This also necessitates an inspection being made of the hose, so that it can be relied upon in case of necessity. To avoid using the fire hose for domestic purposes, it is well to coil a length of old hose near the standpipe, and use this in preference to the fire hose. This also is a help in keeping the fire hose dry. Spanners should be provided with each line of hose, and the play pipes carefully looked after, since, in an emergency, quick action is necessary, and a misplaced spanner, or a stuck play pipe, may seriously delay such action.

The President—Is there to be any further discussion on Mr. McPhail's paper?

Mr. Newberry—It seems to me in connection with this paper, that it had brought out many good points, but none more important than the suggestion Mr. Day makes to the effect that we should get together and co-operate in exchanging our ideas in regard to the accidents which occur. I think anyone of the managers of properties represented here has in his mind an instance of an accident that happened which he could put in pamphlet form to the Secretary, and that the same could be distributed and interchanged. If that were done I am sure we would profit materially through such action. I think we would benefit materially by gaining a knowledge of these little accidents that may come up, which may not look material in themselves but which really are of great importance. I have in mind at the present time an instance where a hose slipped off a hot plate and resulted in considerable damage to the premises. In that particular case there was some talk at the time, and I believe there is now, which resulted I think in an agitation which was brought before the manufacturers of hot plates, in an effort to get them to so manufacture hot plates as to eliminate this danger of explosion. In conclusion let me reiterate that Mr. Day's suggestion of an interchange of ideas with regard to these accidents should meet with the co-operation of our Association.

The President—I think it would be a good movement next year for the Association to establish some system of that kind.

Mr. Harper—I move that the President appoint a committee of 5 to look into this matter of accidents, such committee to be known as the Committee on Prevention of Accidents, and that said committee communtcate with each manager, secretary or some other official to find out the nature of the accidents looking toward the formation of a set of rules for each gas company. [Adopted.]

The President—In connection with this discussion the following communication has been received from Mr. Smit, Superintendent of the North Shore Consolidated Gas Company of Waukegan:

Mr. Smit—While reading over Mr. McPhail's paper, regarding "Prevention of Accidents," the thought occurred to me what benefit such a set of rules as Mr. McPhail's would mean both to company and employees, if practiced; but there seems to be a lack of interest along these lines until some employee has been hurt or some accident has occurred. I suggest that if such a set of rules be gotten up and put into use that they be printed in different languages, for you all know that around a gas works you will find many nationalities represented. Regarding gas works machinery, would suggest putting guards and rails around each piece of machinery where there is any danger of employees getting hurt while at work repairing or oiling same. One of our men, while filling a grease cup on blower fan bearing, had the end of his jacket drawn into the fan and torn off. I, immediately, after hearing of same, took measurements and made some heavy wire sceen guards and inclosed openings, so that the same accident could not occur again. We have at our works a Reynolds station governor which regulates the main pressure in Waukegan. While talking to a salesman I happened to look at the recording pressure gauge and found same showing holder pressure instead of 3 inches pressure. I found this salesman's foot resting on the auxiliary governor which opens up valve in large governor, which, of course, accounted for the different pressure. I at once had a gas-pipe railing put around this governor, so that the same accident could not occur again. We also have an elevator which runs by air. That elevator carries our coke to the water gas generators. I put a safety device on same which cost $15; then tied the elevator to a piece of rope and hoisted same about 15 feet above surface, and cut the rope to see if the safety was going to work. Elevator dropped 1 inch. This only goes to show that some of the accidents around a gas works can be prevented if these little devices are put into use and inspected occasionally. We also have a complete medicine chest, 2 feet by 4 feet 6 inches, with everything handy for first aid. During my time as Superintendent for the past 4½ years this Company has paid practically nothing for doctor's bills, except for one employee who, through his own negligence, was slightly injured while I was away on a vacation. I know that if a superintendent goes through his works about once each week, on a little inspection tour with his foreman, they can always find where some improvements can be made for bettering conditions, both for company and employees, which would put prevention of accidents to a minimum.

The President—Now, Mr. McPhail, have you anything further to say in connection with this discussion?

Mr. McPhail—The time is rather limited and I will close up as quickly as possible. The idea of writing this paper was to get up something that would be of interest and would start the ball rolling for concerted action. I could have presented a detailed list of accidents that have occurred in our Company and other companies, and have taken up much of your time and probably not have been as effectual or beneficial. As to the emergency wagons, they can be used very well in Chicago and the larger companies, but in the case of our company, where we have 35 small towns, some towns having as low as 200 meters, it would be a very difficult matter to—and a very expensive proposition—maintain an emergency outfit. The emergency outfit, however, where it can be used, is very good. In fact, it is the only way to handle an accident and handle it properly. In reference to piping, we pipe a good many houses, and in every case where we pipe a house we conceal it. In fact, one of our factors in securing that class of business has been because we have had men who can conceal piping and do good work. We conceal thousands of feet of pipe in our work, but, of course, it is all thoroughly tested, and, as I say, we receive a good deal of favorable comment and get a good deal of business through our ability to do that. I think the Association is taking the right step in appointing an accident committee and following up the accidents that occur in the different companies, and have them acted upon through the Association. That is one branch of our work that has not been given sufficient attention up to the present time, and I think the committee should begin on this work at once. In reference to the suggestion boxes, I may say at one time I was with a company that had a very good method of getting tips from its employees with reference to safeguarding employees in different lines of work. A suggestion box was kept and every man who made a suggestion that was accepted and acted upon by the company was given a certain amount of money. At this particular time I have forgotten whether it was $2 or $5. The result was, the men would never let an opportunity slip to notify our officials of some improvement that could be made to prevent an accident. The men were all very anxious to do whatever they could to assist the Company in this line of work, and the result,

I know was very gratifying. The reports and suggestions that came in were acted upon and the men were given real credit for their thought. They were also reimbursed as Mr. Day suggested, in another way; the man who was there with the brains to consider preventing accidents, was the one who was favored when an appointment was to be made. They appreciated it and worked very hard in studying out these methods of different ways of preventing accidents. I think that is all I have to say. I want, however, to thank you for your interest in my paper. [Applause.]

The President—Mr. McPhail, I think I voice the sentiment of the meeting in extending the thanks of the Association to you for your paper. It was prepared in a very thorough manner.

An adjournment was then ordered, to terminate at 2 P.M.

(To be Continued.)

[Official Report—Furnished by the Secretary—Continued from Page 1052.]

PROCEEDINGS, THIRD ANNUAL CONVENTION, PENNSYLVANIA GAS ASSOCIATION.

Held at Reading, Pa., April 12, 13 and 14, 1911.

First Day—Afternoon Session.

The President called the session to order at 2 P.M., and said: Now, gentlemen, I desire to suggest to you that the Association is here for the purpose of learning something (one from the other) of its membership; and we want it particularly understood that every man in the room, who has any knowledge upon any subject that he thinks might be of interest to the balance of the membership, should bring it before us. Do not let lack of nerve prevent you from standing up in meeting. The stenographer will give us all an opportunity of revising our remarks; whether those come out in straight English or an odd dialect makes no difference whatever to this body of men. Let us hear what you know, so the rest of us can get the knowledge you have. Don't hesitate to tell us what you know when any one of these cases comes before the meeting. The next paper on the programme is by Mr. J. Vanden Bout, of Williamsport, Pa. Its title is:

INSTALLATION OF GAS ARCS AND CONSUMPTION RESULTS.

[For the text of the Vanden Bout paper, see Journal, *ante*, p. 948.]

Discussion.

Mr. Quillin—I think this is an excellent paper, and it certainly coincides entirely with the experience I have had in putting out gas arcs. In the first place, at one time the gas and electric companies sold arcs; of course, they were the upright arcs of some years ago, but a great many were sold for outdoor lighting. I think, perhaps in 9 cases out of 10, if a person owned them, just as Mr. Vanden Bout said, they got an idea they could maintain them cheaper, or could get someone else to do so. The arcs run down in a very short time, and the plant expense runs up, but they don't get the light out of the arc until finally they hang there and are not used. Of course, we are in the business of selling gas and not gas arcs. For that reason I think the best way to put out gas arcs is on the maintenance plan. A great many articles have been written on maintenance, but I think each plant and locality must figure out the best proposition (or one proposition for them) on the maintenance. In one place the charge is 25 cents a month, in others, 50 cents for the first, 35 for the next four, and 25 for all in excess, in some places even less. It is really a problem for each manager to figure out for himself. I think with the consumption which he has given here on the various arcs, while it seems high to me, I know that our arcs do not go up any place near to the figures quoted. I think our average consumption on inside arcs is about 18,000 feet per year. Now, Mr. Vanden Bout has none on here listed; yes, department stores, 16,000 is one which that comes under. Many of ours come less, but the average is 18,000 cubic feet. We installed a great many outside arcs last winter, the inverted type being used. We have ran piping and put on a check meter, and in different places varying from 1 to 4 arcs on a meter. We put a meter for each man, and our man turns them on at dusk and off at 11:30. A flat rate is given. The appearance of the arc is one of the best advertisements we have had. We have not had to solicit very hard to get increases, because a man who sees his neighbor using one, and with such good lighting effect, then they maintained and advertise themselves to the point of bringing in people without being solicited. I do not know of any new suggestions, because this paper, as I said in the beginning, is very complete and covers every point.

The President—The paper is now open for general discussion, gentlemen. Let us have something from somebody.

Mr. Quillin—Let me ask a question that may lead to brisker discussion. We charge 25 cents a month maintenance, no matter what the man has, whether it is 1 arc or 10. A good place, to my thought, where we can all profit is that some of the other members tell us what maintenance they charge, and that which they find the best. I think that 25 cents a month, to a consumer using 10 or 12 arcs, is rather high; but, of course, 25 cents a month, when only 1 arc is in use, hardly covers our expense.

Mr. Lamson—A question I would like to ask is how the depreciation should be handled in the cost of these arcs, for unquestionably a large question is involved in buying these arcs and putting them out on the maintenance basis. This charge of 25 cents a month includes the maintenance and the lamp, and I do not see how they can cover anything else. I would like to ask if this depreciation is handled any other way—of course, one has to charge something in handling them. They are a great expense to the company, and it has always been my belief (I have yet to be convinced otherwise) that unless a man has some equity in the installation, or has something to hold him, that, with the slightest provocation, he loses interest and is likely to throw out the whole installation. Paying for his arcs on the monthly plan, or in some other way having an equity in them, he is apt to deal with more consideration than if he took them simply on the maintenance plan, or so much a month, and keeping them as long as he liked, then becoming dissatisfied, throws them out. This gentleman did not say whether they contract for 1 year or 2 years, or whether kept in as long as the customer wants to use them.

Mr. Rhoades—As to Mr. Lamson's question, we took that into account as to the arcs just installed. We have a very comprehensive contract, yet it is binding throughout for the period of time for which the lamps are to be used.

Mr. Lamson—About how long is that?

Mr. Rhoades—We figure that the installation, including everything applicable, will work itself out in 4 years. This includes, of course, maintenance.

Mr. Anderson—We charge 50 cents a month to cover maintenance and depreciation on the upright arc. We grade them slightly for larger installations, starting at 75 cents on the inverted arc, grading it in the same manner in large installations, charging off each month for depreciation the part that would be the total investment at the end of 5 years.

Mr. Lamson—Is that a contract?

Mr. Anderson—We make a contract for a period of 1 year, which is self renewing.

Mr. Owens—I would like to ask Mr. Vanden Bout how much they charge on this flat basis, and whether the lamps are metered; also, what is the average consumption? Regarding the question of depreciation of lamps, I understand that, under special conditions, financial arrangements are made to cover depreciation; but having paid for themselves how many lamps have been taken out and replaced by a modern, up-to-date lamp of different type? In how many cases do they take out an upright lamp and put in an inverted, provided, of course, the inverted gives better satisfaction, or is more suitable.

Mr. Shacklett—In 1902 I installed upright arcs on the 25 cents a month basis, any balance of maintenance expense going to depreciation, a sufficient amount being taken out of the gross profits to bring the depreciation account to 25 cents. When the enameled stack became popular we put up a great many of those for customers, but with the advent of the inverted arc we changed a great many and charged 50 cents a month. When there is a shortage in the maintenance account, as there usually is on those rates, we take it out of the profits. The arc, as it stands on our books to-day, will inventory at least 2 or 3 times the amount at which they stand on the books.

The President—How many companies here represented put up arc lights free? [Three hands were raised.] How many charge for them? [Eight hands were raised.] I would like to say for Reading we have approximately 2,000 lamps, and sold every one of them, save a few that are out on a flat rate. These have been paid for long ago by the monthly charge for them.

Mr. Rhoades—Just a question there that might throw more light on the subject. We are not all situated as nicely as you are in Reading; not by any means. With a population of 40,000 inhabitants, and two electric companies fighting you day and night, with you not intend-

ing to let them close you out of the field. you have to do some things over which you do not count the cost. It is not the best business by any means to put these up and maintain them free. If I could put them up at $5 a month and get 50 cents a month maintenance out of them, I would do it; but you can't do that where very great competition exists. I know some gentlemen who are getting $4 or $5 a month for these lamps. The question is at what rate do you put these out. If Mr. Vanden Bout will explain that we will understand it probably a little better. We were working against 75-cent window lighting. We have a good many outside arcs. The price we formerly asked was about $3.50 a month, which was neither large nor very remunerative. It seems to me you could put these arcs out, getting through with some profit on your gas in charging off ¼ or 25 per cent. for depreciation, and $3.25 a month for your maintenance. Consequently we went to work on a basis of $3 a month. We tried a scheme of piping wherever we could hook 6 or 8 lamps on the same piping installation for the outside work, putting them in in that way. But that piping, of course, is a charge against your stock, while, at the end of your 4-year contract, the piping of those lamps will come back, so you are not entirely wrong on that installation price, or one might count that simply as a rebate on installation cost. At $3 a month we now net about $1 for gas, wherefore anyone here who, being up against a good electric fight and wanting to get right in the field and make the other man hustle, should you care to adopt that plan, one can do it all right. Our lighting rate is $1.40, but a flat rate on the short hour and large installation of one period, and small installation cost per lamp, will allow you to get a little under the $1.40 mark. No gas company can afford to allow a competitor to squeeze it out entirely of that kind of work. They may take the electric window lighting from you, but if you can get this outside lighting from the arc lamp, in 9 cases out of 10 you will find 25 to 50 per cent. of that window lighting is going to be of the arc sort, and that is going to be turned into your arc lamps, which gives you quite a leverage on the other man. If a party wishes to have a combination of window and curb lighting, place a lamp slightly over the curb at an elevation of 10 feet; then he can light both his window and store front, especially in some forms of illumination where the light would naturally be thrown upward and not cut off.

Mr. Lamson—I would like to ask about this 4-year contract. Supposing that in 1 or 2 years that contract is void through one man going out of business or moving away. Can you put these lamps in, using them on another contract, or is it necessary to use a brand new lamp every time you make a new contract? I know the scheme has been tried in other places, the general tendency being that the man who went into a contract for a store demanded new lamps. In consequence the old lamps that had been used a year or two would have to be completely overhauled and cleaned up, or else furnish a new lamp. If any gentleman has had experience in using these lamps over again, I would like to hear it. If lamps that are taken out after 2 years cannot be put back, or that other man won't have them, I think you are going to have a lot of trouble in the general course of events.

Mr. Rhoades—We have not had any trouble in putting up lamps again should a contract be void in 2 years, but right there is where the party who sells the lamps outright is to the good, which is by far the nicest way, if you can get the man to pay your maintenance or allow you maintenance for the lamp and own it.

Mr. Vanden Bout—The consumption figures I have on different cities average 32,000. The average per lamp I thought was very high. much higher than there was any need for. Our average per lamp is something over 17,000. Of course, I can only speak as to our lamps. Those from other cities, although I thought they were high, were furnished as accurate.

The President—If there is nothing further in this line of discussion, I think we ought to pass a vote of thanks, not only to Mr. Vanden Bout, but also to the writer of the paper read this morning—Mr. Butterworth.

[On motion, such vote was passed and tendered.]

(To be Continued.)

MR. J. B. WHARTON, formerly General Agent of the properties of the Susquehanna (Pa.) Light and Power Company, at Wilkes-Barre, Pa., has been promoted to the post of General Manager of its properties in Richmond, Ind. His successor at Wilkes-Barre is Mr. Ray Ammerman.

A Mexican Town and a Modern Gas Works.

[Prepared for the JOURNAL by MR. W. S. ALDRICH.]

Under separate cover I am sending you two copies of "Progreso," which we are publishing monthly, and which you will see is purely educational. If you are unable to read Spanish, of course it is your misfortune, but I will tell you that I make no claim to originality. On commencing operations in the ancient settlement of Guadalajara, Mexico, I found the people had been using charcoal for fuel for 500 years and 90 per cent. of them never even heard of gas. Even our competitor, the local electric company, seems in a happy state of ignorance, as its managers are informing the people that gas is a liquid, dealing death and destruction wherever it appears; that the San Francisco earthquake and subsequent destruction of the city by fire were caused by gas, in which they are probably to some extent right, for gigantic eruptions of nature have been caused by gas in some form or other. However, "Progreso" will from time to time tell the people exactly what gas is and what it will do.

In the making up of this paper I have begged, borrowed, stolen, plagiarized, abstracted and hypothecated every and all ideas which have been known in the States for a long time past, and although the pages of "Progreso" may not be overflowing in new points to a gas man in Uncle Sam's territory, the first issue has been received here with open arms, and we have been kept busy thanking our patrons for their congratulations.

As my old friend of 20 years' acquaintance, and one who has always had a good word to say for me during my professional career, I am placing you, dear JOURNAL, on my mailing list, and hope as we grow older to publish something that may be new, even to gas men in the States. So much for the first number of "Progresso." Read it if you can; criticize it certainly, and let me have your unbiased opinion of its merits as an educational emporium. This is our first effort in the literary field, and our task was not made easier by our total ignorance of the Spanish language, so that everything published had to be translated into their vernacular.

Ours is a coal gas plant, strictly high pressure, with individual governors. We broke ground, October 6th, 1910, and commenced to furnish gas on the 1st of May, although the plant was practically completed, March 1st, 1911.

The plant occupies 9,000 square meters of land, and comprises a retort house, engine room and meter house. The primary and secondary condensers, the ammonia washer, scrubber and Chollar purification boxes are in the open air.

This is a semi-tropical climate, with 365 days of sunshine in the year, the very warm months being April and May, but even then it is far superior to New York city in August. In fact, while I have travelled through nearly every State in the Union, and have passed much time in California, in my judgment there is no better climate than this under the blue canopy of Heaven, and when I leave here I will miss the gorgeous sunsets and oriental environment that abound here in several parts of the city.

To give you an idea of the dimensions of the plant, I will say that, including the wall which surrounds the property, we used 148,212 common brick, 57,585 adobe brick, which are made locally out of a peculiar soil containing a species of lava and lime, and these are 22 inches by 13 inches wide and 3 inches thick. In the foundations of the wall, gasholder, tank, concrete floors, etc., we used 1,042 cubic meters of large and crushed rock, 264,046 kilos of lime, and about 6,400 cubic meters of sand.

The holder is of 200,000 cubic feet capacity, resting in a tank 76 feet 6 inches diameter. The soil is of a vegetable character for about 18 inches, when it changes into a soft limestone and at 2 feet 6 inches we found sand, which material continues for about 30 feet, when we struck water. After taking off about 6 inches of the top layer of sand, it was thoroughly tamped and the foundation was laid. The outer ring was 4 feet 6 inches in diameter, 4 feet 6 inches deep, the inner ring being 2 feet deep; and in the construction of the foundations there were used 423 barrels of English Portland cement. The sand and water used in the construction of the buildings, foundations, etc., were obtained from the property. The first well driven was 2 feet 6 inches diameter, and about 20 feet deep. We used many hundreds of thousands gallons of water from it, and the cost of digging was $3.20 Mexican curency, or $1.60 gold, In selecting a location for a well for our permanent water supply, I had in mind the above facts, so chose a spot about 12 feet from the first one. The new well is 3 meters ln diameter and about 11 meters deep. In order

to obtain depth we used a centrifugal pump, connected with an electric motor, and we surely made the dirt fly. We ceased going down when we had obtained 6 feet of water and, when the holder tank was ready to be filled, we used a 4-inch centrifugal pump connected to a 7½-horse power electic motor. The tank was filled in 42 consecutive hours, and without lowering the water in the well ¼ part of an inch. The sides of the well are of brick and plastered from about 10 feet from the top. We covered the well with red brick set edgeways, with a cement floor, leaving an opening of 1 square meter for inspecting, etc., which floor is about 10 feet above the water, and this we make our pumping room. By the side of the well we have an elevated water tank of 4,000 gallons capacity and sufficient water for all time, at no cost other than the steam for operation of the pump.

The foundation of the wall is of large rock, about 5 feet deep underground, then 4 layers of red brick, upon which was placed the adobe; the top of the wall, 10 feet above the yard level, was capped with brick and plastered. The walls, inside and out, were then plastered with a mixture of adobe, sand and lime, then lined, and it now presents the appearance of blocks of granite. Altogether it is a very pretty plant, and I think you will agree with me when I send you a picture of it.

In designing the retort house, I decided to erect it with an open front facing north. What occasional winds we have are from the south, so that our benches are not subjected to any cold air currents. The benches are operated from a cast iron stage floor, 7 feet 6 inches from the basement floor, the coal is elevated to the retort house floor by means of a "Ridgway," and a double hand-rail extends the whole length of the retort house, which contains 4 benches of 6's, of the semi-regenerative type. Every piece of the moving machinery is duplicated; every apparatus, from the retort house governor to the high pressure regulator at the outlet of the compression tank, is by-passed; every valve is above ground, the connections round the works being 10 inches.

To date we have laid 62 kilometers of high pressure main, 3 inches, 2 inches and 1½ inches. It is steel line pipe, with recessed threads and couplings. Dresser insulating couplings are used every 500 feet, also each side of the street car tracks, where the pipe passes under. In addition to this, pipes under street car tracks are placed in troughs ⊔ shaped, in which is placed a mixture of coal tar, ground lava and sand, which when set is almost a solid mass, and will amply protect the pipe from electrolysis for many years to come. As there are 25 miles of asphalt streets, main laying was rather an expensive item, and as the local asphalt company tried to hold us up on repairs, demanding $7.25 Mexican currency per square meter, I decided that it would be far more economical, to say nothing of improved service to our patrons, if the mains were laid along each side of the sidewalk. This we have done, giving a free service to anyone who showed a disposition to use gas when we had demonstrated its adaptability and improvement over present methods of lighting and for fuel. This not only saved considerable money in the feeders, but obviated cutting the asphalt for laterals for services.

A great many of the streets outside the asphalt district are paved with cobble stones, where 2-inch pipe only is used off the main 3-inch feeder, which consists of a loop of 26,000 feet of 3-inch pipe. From this loop I have formed other 2-inch loops, and at this writing it may be stated that the system is without a dead end. The main on each side of the paved streets is 1½ inch and extends east, west, north and south, 12 blocks without a fitting, except where it is connected with the main feeder with Dresser couplings.

To this date we have laid 465 services of ¾-inch galvanized pipe, with Mueller saddles and two street ells, placed at right angles to each other. To show you the rapidity with which mains were laid I may say we have averaged 12,000 feet per week, with 4 men, a pipe man and a foreman, at a cost of approximately $83 gold per week, but I should state that the opening of the ground and back-filling and repairing of the cement sidewalks were let out by contract.

There are no drips in the system save one, about 1,500 feet from the plant; but we have a few taps on the bottom of the mains at various places just for blow-offs, at such times as we may inspect the mains for any possible condensation which may occur. We are using a double high pressure gas regulator, furnished by the Johnson-Reynolds Company, and the compressors are single stage, of the Laidlaw Dunn-Gordon type.

With two salesmen we have sold more than $12,000 worth of appliances, ranging from $5 to $250 gold, and now, that the people can see what gas is like, we are simply swamped with orders and cannot get gasfitters enough. Unfortunately the revolution has played havoc with our freight, and although we have orders for 196 Humphrey inverted arcs, which were ordered last December, and shipped via New York, by water, they have not yet arrived, but we expect them in the course of a day or so.

We have a fine office building with a very large fitters shop and store-room, with stables in the rear—all under one roof.

I have briefly stated what has been accomplished in the 7 months since we broke ground. There is no doubt that before the year is out we will have at least 1,000 consumers and, notwithstanding the devious methods of our competitors, we venture to prophesy that in 2 years' time we will be doing 75 per cent. of the lighting of the downtown district.

In conclusion I may say that, although the success of this enterprise in a foreign land is assured, it will need a persistent, educational campaign for a long time to come. I am now introducing an up-to-date American office system, and after that is completed my task will be finished.

The McKenzie and Mann interests, of Toronto, Canada, have done me the honor to invite me to construct a similar plant at Monterey, Mexico, but as I have been absent from my family so long, I cannot accept, unless I am permitted to take a reasonable rest.

Steam and Air in Gas Producers.

The *Journal of Gas Lighting* reports that, at a recent meeting of the Institution of Mechanical Engineers, a paper on "The Effect of Varying Proportions of Air and Steam on a Gas Producer," was read by Mr. E. A. Allcut.

The experiments recorded in the paper were performed in 1909 on a small gas producer at the University of Birmingham. The chief object of the research was to determine the influence of varying quantities of steam on the general working and efficiency of small gas producer plants. The air supply was kept as constant as possible, while the steam supply was increased from nothing to a maximum of 1.14 pounds per pound of coal used. To avoid the complications and uncertainties of measurement which attend the presence of tar and volatile hydrocarbons, small anthracite coal was used in each trial. The steam was generated by a steam coil inside the producer itself, and the air was blown into the closed ashpit by a fan. Steady conditions were thus obtainable throughout the trials, and it was hoped that they would clear up some of the uncertainty that seems to exist respecting the amount of steam necessary to give maximum efficiency and best all-round working in a gas producer. Comparison between these results and those of Messrs. Bone and Wheeler, in 1906, on a 2,500-horse power Mond plant, should, moreover, throw light on the theory of gas production.

Having considered the reactions taking place in a gas producer, the author described the plant used by him, which was constructed in the workshops of the Birmingham University, and the arrangements made for the trials. The producer was similar to those of the ordinary suction type, but was worked on the pressure principle; the air being blown into the closed ashpit by a fan. The steam was generated in an internal coil, and, joining the air in the ashpit, passed along with it through the grate into the fire. The internal diameter of the firebrick lining was 10 inches and the height of the fire from the grate to the bottom of the distributing cone was 25 inches. The object of using so small a producer was to enable it to be tested in 4 or 5 hours. The washer consisted of a cylindrical steel shell traversed by a shaft strung with thin disks, alternately pierced at the edge and center, causing the gas to pass along the washer in a zigzag direction. The lower half of each disk was immersed in water. The shaft was rotated at 76 revolutions per minute by an electric motor; and the gas, being continually swept into contact with the wet surface of the plates, was cooled and cleaned.

The air and gas were each measured by observing the difference in pressure at the two ends of a calibrated pipe, the temperature and pressure also being noted. The coal and water used were each observed by weight, and samples of both coal and gas were taken at regular intervals. At the end of each trial the temperature of the producer was taken at the grate, and at intervals of 3 inches upwards from the grate to the top of the producer, by means of an electric resistance thermometer. The gas was analyzed in the special apparatus described in Prof. F. W. Burstall's "Third Report to the Gas Engine Research Committee." The calorific value of the coal was ascertained by combustion in a Mahler bomb calorimeter, and the moisture and ash in it were estimated. Efficiencies were calculated from

the calorific value of the raw coal and the higher calorific value of the gas, and include the heat required to vaporize the water feed.

The results of the experiments are tabulated, and also shown diagramatically. It is seen from them that the percentage of hydrogen present in the gas ceases to rise with increasing amounts of water fed into the producer when the water feed exceeds 0.75 pound per pound of coal. This corresponds to the decomposition of 72 per cent. of the total weight of water fed into the producer. The maximum amount of steam that can be decomposed by anthracite at a temperature of 1,832° F. is about 0.535 pound per pound of coal. The corresponding result obtained by Messrs. Bone and Wheeler is about 0.625 pound of water per pound of coal. Consequently there is no advantage, but only loss, in raising the steam supply beyond 1.5 pounds for large producers and 0.75 pound for small ones. Excess of steam merely takes steam from the producer and loses it in the washer, besides reducing the temperature of the producer and so yielding a poor gas. The author says the most significant result of the trials is that the percentage of carbon dioxide remained practically constant, in spite of the increasing feed of steam to the fire. The calorific value of the gas produced was low throughout, which was partly due to the low percentage of hydrogen resulting from the high ratio of air to steam used, and to the comparative absence of methane. The calorific value of the gas reached a maximum at a water feed of 0.75 pound per pound of coal, and as the maximum yield of gas also occurred at about this point, the highest efficiency of all is recorded at that feed.

The conclusion arrived at by the author as the result of his experiments is that the increased supply of steam beyond the point of maximum efficiency causes a decrease in efficiency proportional to the ratio of the oxygen in the steam to the oxygen in the air. This decrease, in the case of two producers, is the same for equal rises in the value of the ratio. Whether this also holds for other producers can, he says, only be determined by further investigation.

Recent Patent Issues.

Prepared for the AMERICAN GAS LIGHT JOURNAL by ROYAL E. BURNHAM, solicitor of patents and counselor in patent causes, 833 Bond Building, Washington, D. C., from whom illustrations and specifications of any patent mentioned below may be obtained for 10 cents.

992,840. Gas Producer System. G. Akerlund, Atlanta, Ga., assignor to the Gibbs Gas Engine Company, same place.

992,907. Apparatus for Controlling Gas Burners from a Distance. F. Rossbach-Rousset, Tempelhof, Germany.

992,944. Method of Enriching Gas for Illuminating Purposes. H. L Doherty, Madison, Wis.

992,959. Process for Producing Inverted Incandescent Mantles. C. K. Harding, Chicago, Ills.

992,966. Fuel Gas Burner. C. A. Kurz, Jr., and G. G. Dedekind, Dayton, O.

993,085. Globe Holder for Lamps. T. J. Little, Jr., Woodbury, N. J., assignor to Welsbach Light Company, Gloucester City, N. J.

993,111. Safety Gas Burner. C. Schneider, Jersey City Heights, N. J.

993,160. Gas Producer. R. V. Farnham, Skelmorlie, Scotland.

993,164. Combined Regulator and Cut-Off. J. J. Heitz, Pittsburgh, Pa.

993,241. Gas and Like Cooking Oven. J. A. F. Glover, Wandsworth, England.

993,322. Gas Producing and Consuming Apparatus. H. L. Doherty, New York city.

993,334. Inverted Incandescent Mantle. C. K. Harding, Chicago, Ills.

Items of Interest
FROM VARIOUS LOCALITIES.

MR. F. B. BRIGGS, who has been in the employ of the North Adams (Mass.) Gas Light Company since 1893, for the greater part of which time he has been Superintendent of Manufacture, handed in his resignation some days ago, to become effective the 1st inst. The unfortunate and really regrettable thing that prompted this decision is the condition of his health, which has been such as to compel him to retire from all active work.

THE Wakefield-Reading gas bill, which was passed to be engrossed by the Massachusetts Senate some days ago, will undoubtedly become a law. Under its chapters the bill gives permission to Wakefield to sell gas to Reading, and permits the latter to sell electricity to the former. This necessarily stands for an exchange of gas and currents on a co-operative basis, in case Wakefield should at any time decide to discontinue the electric division of its municipal light plant. The bill also grants to Wakefield the right to lay pipes in Reading, the latter having the right to string wires in the former place, should the occasion for such action arise.

THE Directors of the Attleboro (Mass.) Gas Company have determined to rebuild the plant, and to make large additions to its distributing service. The plans include provision for a new storage holder.

THE Empire State Gas and Electric Association will hold its next meeting in Trenton Falls, N. Y., Saturday, the 24th inst. Headquarters will be in the Hotel Trenton, and the Association will virtually be the guests of the Utica Gas and Electric Company, for it is in Trenton Falls that its up-to-date electric plant is located.

THE contract for new water gas apparatus, to be constructed for the Peoples Light Company, Pittston, Pa., has been awarded to the Gas Machinery Company, of Cleveland, O. The set now in use at Pittston was installed there some years ago by the Gas Machinery Company, and the placing of the second one is necessitated by the increase in the Pittston folks gas sendout.

THE last hearing before the up-State Division of the Public Service Commission, in respect of the investigation going on respecting conditions governing or influencing the supply of artificial gas in Buffalo, N. Y., was notable for the testimony given by Alfred E. Forstall. The notable thing in connection with Mr. Forstall's testimony, so far as that affected the mind of Judge Hammond, who represented the corporation of Buffalo during the proceedings, was that Mr. Forstall's appraisal in 1911 exceeded that given by him in the same premises in 1907. The hearing was put over until the 6th inst.

A CORRESPONDENT in Bristol, Tenn., forwards under recent date some account of the opening, a fortnight or so ago, of the beautiful, commodious and businesslike offices in the building constructed to house same, which building is located in the business center of the city, on State street, for the Bristol Gas and Electric Company. Our correspondent goes on to state: "The formal opening was marked by a reception which for brilliancy eclipsed anything heretofore seen in this progressive place. The spacious building was brilliantly illuminated inside and outside by myriads of incandescent lights, and during the evening 2,000 or 3,000 people visited the new quarters of the enterprising Light and Power Company. Wilson's Greater Bristol Band furnished music during the evening, while souvenirs were presented to the guests, including elegant bound steel engravings of President Taft, carnations to the women and cigars to the men. One thousand Taft souvenirs, 800 carnations, 6 boxes of cigars and several hundred cloth bound cook books, besides a quantity of literature on lighting and heating, were given out during the evening. The handsome and spectacular new electric sign, extending from the sidewalk to 30 feet above the top of the building, was turned on for the first time and was a revelation to those who saw it. It is a new design and contains 2,000 incandescent lights. The shunting effect of the flames leaping from stately columns on either side and uniting at the center above the building presented a most beautiful spectacle. The lamps are red, green and white. The 4 large windows in the 2d story are each inclosed by separate outlines of white lamps while above them and extending across the building is artistic zigzag with a chasing effect that attracts the eye. The officials and their wives received the visitors, and during the evening their was on display a full line of gas and electric appliances, all connected and in working order. These were demonstrated to the visitors. The main offices are toward the rear of the spacious room, while the office of Mr. A. K. Young, Commercial Manager, is at the right of the entrance inclosed by quartered oak railing. The main office is inclosed by regular bank fixtures, with a separate room for the cashier, that is similar to a bank teller's apartment. Immediately behind the main office is the vault which, with the exception of the bank vaults, is the largest in the city. Immediately to the right of the main office is the office of Mr. S. M. Vance, General Manager. It is cut off from the main offices. The work rooms of the gas and electric departments are on the 2d floor. In April, 1910, when the Doherty Operating Company took over the Bristol Gas and Electric Company, electric signs were practically unknown in Bristol and midnight window lighting was unheard of. Now there are 52 large and handsome electric signs in the city, while the windows of practically all of the

business houses burn until midnight. State street was formerly lighted after dark only by the city lights, but now it is brilliantly illuminated until 12 o'clock every night as a result of the progressive work of the Company under the Doherty ownership. What is true of State street street is true of other streets in the business section of the city. July 4, last year, the Doherty Company presented to Bristol the monster electric slogan sign burning 1,000 lamps. This served to increase the popularity of electric advertising. In September the Company installed the mammoth 'Cook with Gas' sign on the Dooley-Bayless building. Now it has installed an electric sign upon its office that eclipses anything in Bristol. Immediately after taking over the local Company the Doherty Company put into effect its nation-wide policy of getting close to the people. It has joined heartily into every movement for the improvement and betterment of Bristol. It has sought to get closely acquainted with its consumers and has accomplished this purpose. It has pursued the policy of making itself understood to the public."

MR. W. B. JOHNSON, President of the Board of Town Commissioners, of Elsmere and Richmond Park (suburbs of Wilmington, Del.), has assented to the proposition that the Wilmington Gas Company be permitted to pipe the districts named, provided the charge per 1,000 shall not exceed $1.15 per 1,000 cubic feet. This puts an end to the scheme of certain localists to "install and operate a municipal gas plant."

SUPERINTENDENT MILLER, of the Annville and Palmyra (Pa.) plant, has convinced his principals that it would be a good move to extend the Company's system to and through the outlying settlement of Hummelstown.

IT is reported that the Kansas Gas and Electric Company, of Wichita, Kas., has purchased the Independence (Kas.) electric lighting plant.

MR. WM. A. CALLOPY, for some time on the commercial force of the Citizens Gas Company, of Terre Haute, Ind., has resigned. To show how facile the commercial cadet engineer can be, Mr. Callopy has determined to engage in the grocery business in Terre Haute.

PRESIDENT J. L. RICHARDS, of the Boston Consolidated Gas Company, having determined to make a trip abroad this summer, for the purpose of touring the British Isles in an auto-car, was recently made the guest of honor at a dinner, covers for which were set in the Parker House. During the after dinner communing, Treasurer Grant noted the great growth of the business of the Companies since Mr. Richards assumed the executive directory thereof. As an instance he cited the case of the Boston Consolidated Company proper, the increase in output of which amounted to 64 per cent. The East Boston Company gains equalled close to 200 per cent. His hosts (the department heads of constituent companies) also presented Mr. Richards with an elaborate and complete automobile "kit."

THE properties of the North Shore (Chicago) Gas Company are being appraised, the figuring thereon being in charge of Messrs. J. B. Klump, S. B. Rutledge and J. W. Henninger, of the U. G. I. Company. Manager Goodnow, however, declares that this appraisal has nothing whatever to do with a probable sale of this concern to either the Peoples Gas Light and Coke Company or the U. G. I. Company, of Philadelphia; in fact, that it is merely a step to determine exactly what its property values are; further, that it is proposed to have an appraisal of like sort made here in each period of 5 years.

MR. F. LYON BROWN, of Chicago, avers that he will proceed forthwith on construction work on the plant for Moss Point, Miss., a franchise for the operation of which was recently granted him by the local authorities. He is required to post a $5,000 bond as a guarantee of good faith.

"W. B. M.," writing from Washington, D. C., under date of the 28th ult., informs us that the Board of Directors of the Washington Gas Light Company has passed favorably upon the proposed financial reorganization of the Georgetown Gas Light Company, which, of course, means the removing of possible obstruction to the plan outlined by the Directors of the Georgetown Company at their last meeting. It means 85-cent gas for the people of Georgetown, instead of the $1 rate now obtaining, the concession to take effect likely before September 1st, and it means the erection of a new plant at Georgetown, which is surely needed, for this beautiful residential locality is growing with the rapidity of the proverbial reed. It also stands for a bond issue of $1,000,000 by the Georgetown Company, to take up its old certificates of indebtedness and quite a bit of floating debt, possibly in all $300,000. The balance is to go to building the new plant, which is being planned for on a scale that will put it up in the first ranks of modern gas works' type. The Company will, during the reconstruction period, purchase its gas from the Washington (D. C.) Company at an agreed on figure. The meeting of the Georgetown shareholders to indorse this project will be held next Monday, but it is already as good as sanctioned, since the Washington Company (which holds the controlling interest in the Georgetown Company) instructed its Secretary to vote its shares in favor at a special meeting held to consider the matter prior to the sailing of Mr. John R. McLean for Europe.

THE New Haven (Conn.) Company has completed its main extension to the Baldwin Cottages and the restaurant at beautiful Branford Point, and to Pine Orchard as well. In this connection the greatest meed of praise is due to the management of the New Haven Company for the way in which it has judiciously extended its main system to and through outlying points. The work has been done in no flighty way or style, but only after painstaking, thorough estimating as to the present worth and tentative value as interest earners of the districts concerned.

THE lower branch of the Massachusetts Legislature recently adopted the following measure:

"*Ordered*, That the Board of Gas and Electric Light Commissioners shall investigate the operation of demand indicators, so called, used by electric light companies, and shall determine whether or not it is expedient to regulate or prohibit the use of such meters. Said Board shall report on this subject to the next General Court not later than January 15th next."

THE docket for the June term of the Hardin County Circuit, Kentucky, includes the case of the Kentucky Heating Company against the Louisville Gas Company, in which plaintiff seeks the trivial sum of $200,000 damages for "wrongs done to it" in respect of certain *laches* by defendant.

MR. T. R. VOLNEY, writing from Norristown, Pa., under date of the 29th ult., forwards the following: "Last week Mrs. Ruth Burtis, in a suit brought in Norristown against the Radnor (Pa.) Gas and Electric Company, in which plaintiff sought to obtain damages for injuries alleged to have been received by tripping over a gas plug projecting above the surface of the sidewalk in Nazareth, asserted that her injuries prevented her from hooking her dress in the back. 'That's nothing,' remarked N. H. Larzlere, counsel for the Company, 'I don't think there is a woman in Montgomery county who can; at least any married woman.' The case is under advisement."

THAT checkered career gentleman, James R. Hanna, Mayor of Des Moines, Ia., evidently believing that in numbers there is strength, has added to his light brigade "Prof." (otherwise "Mister") Marks, Edward Bemis and J. A. Hall (whoever he may be), as experts to go full tilt against the Des Moines (Ia.) Gas Company, which recusant corporation is combating in Court the unreasonableness of the city ordinance ordering it to sell gas at 90 cents per 1,000.

AT the annual meeting of the shareholders in the Consumers Gas Company, of Reading, Pa., the following Directors were elected: L. T. Custer, R. L. Jones, Lewis Lillie, Walton Clark and Wayne Mac Veagh.

CAPTAIN JOHN TENNANT, for years a Director in the Oakland (Cal.) Gas Light and Heat Company, died at his home, 1321 Madison street, Oakland, the night of May 19th. He was in his 87th year, having been born in New York city, December 24, 1826. He came to the Coast in 1848, engaged first as a miner, later on taking up steamboating, and amassed a fortune. He retired from continuously carried on active work in 1876, although his connection with the Oakland Company, and also with the Fireman's Fund Insurance Company, was always actively maintained by him. For several years he was Vice-President of the Oakland Company, and was (and with good reason) a firm believer in the perspicacity of Mr. Jno. A. Britton. Deceased was a life member of the Society of California Pioneers, and was most popular in and esteemed by the people of the city in which he had lived for such great length of time.

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MONDAY, JUNE 5, 1911.

The Market for Gas Securities.

The "decision" in respect of the "cigarette-snuff-stogie" combination having been handed down, and that the speculatively inclined Wall street man is satisfied that gas had nothing to do with the case, a trifle more animation has been shown in gas shares. Consolidated opened to-day (Friday) at 146 to 146¼, and there was quite some inquiry for cash stock.

Brooklyn Union, too, was rather to the good, and while the rise in the bid over a week ago is returned at one, even the most superficial viewing trader on the Exchange figures that a marked advance in this specialty is due on the knowledge that Bemis-Marks & Co., are to "review" the Hagenah report on a fair figure for gas in Chicago, the stock seems to have recovered a trifle from its lethargy, the increased strength being likely traceable to the fact that "the worst is known." Lacledes remain steady. The bond market displays signs of awakening, and the general business outlook, if activity in the gas trading line is an indication, is brighter than for the past 4 years.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

115 BROADWAY, NEW YORK CITY.

JUNE 5.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share:

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked*
Consolidated Gas Co.	$73,177,000	100	146	146¼
Central Union Gas Co.—1st 5's, due 1972, J. & J.	3,000,000	1,000	103	105
Equitable Gas Light Co.—Con. 5's, due 1932, M. & S.	1,000,000	1,000	115	118
Mutual Gas Co.	3,500,000	100	155	165
New Amsterdam Gas Co.—1st Con. 5's, due 1948, J. & J.	11,000,000	1,000	100	101½
New York & Richmond Gas Co. (Staten Island)	1,500,000	100	35	50
1st Mtg. Gold Bds. 5 p. ct.	1,000,000	—	98¼	100½
New York and East River—1st 5's, due 1944, J. & J.	3,500,000	1,000	103	105
Con. 5's, due 1945, J. & J.	1,500,000	—	95	100
Northern Union—1st 5's, due 1927, J. & J.	1,250,000	1,000	94	100
Standard	5,000,000	100	50	70
Preferred	5,000,000	100	70	100
1st Mtg. 5's, due 1930, M. & N.	1,500,000	1,000	103	105
The Brooklyn Union	15,000,000	1,000	143	144
1st Con. 5's, due 1948, M. & N.	15,000,000	—	106¾	107
Yonkers	999,650	500	120	—
Out-of-Town Companies.				
Bay State	50,000,000	50	5/8	7-16
" Income Bonds	2,000,000	1,000	—	75
Binghampton Gas Works	450,000	100	—	—
" 1st Mtg. 5's	509,000	1,000	95	100
Boston United Gas Co.—1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	5	8
Bonds, 5's	5,250,000	1,000	59	60
Capital, Sacramento	500,000	50	—	35
Bonds (6's)	150,000	1,000	—	—
Chicago Gas Co. Guaranteed Gold Bonds	7,000,000	1,000	104	105¼
Cincinnati Gas and Electric Co.	20,500,000	100	92	93
Columbus (O.) Gas Co., 1st Mortgage Bonds	1,500,000	1,000	96	98
Columbus (O.) Gas Lt. & Heating Co.	1,682,750	100	90¼	91
Preferred	3,026,500	100	75¼	80
Consumers, Toronto	2,000,000	50	200	204
Consolidated, Baltimore	11,000,000	100	106½	—
Mortgages, 6's	3,600,000		89	100
Chesapeake, 1st 6's	1,000,000	—	—	—
Equitable, 1st 6's	910,000	—	—	—
Consolidated, 1st 5's	1,490,000	—	—	112
Consolidated Gas Co. of N. J.	1,000,000	100	15	—
Con. Mtg. 5's	976,000	1,000	92	95
Bonds	75,000	—	—	100
Denver Gas and Electric	3,500,000	—	102	105
Detroit City Gas Co.	6,580,000	—	—	50
" Prior Lien 5's	5,619,000	1,000	97	100½
Detroit Gas Co., 5's	381,000	1,000	75	80
Equitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1,000	—	101
Essex and Hudson Gas Co.	6,500,000	—	39	40
Fort Wayne	2,000,000	—	—	—
" Bonds	2,000,000	—	55	—
Grand Rapids Gas Light Co., 1st Mtg. 5's	1,350,000	1,000	100	101
Hartford	750,000	25	190	200
Hudson County Gas Co., of New Jersey	10,500,000	—	112	113½
" Bonds, 5's	10,500,000	—	108	108½
Indianapolis	2,000,000	—	78	83
" Bonds, 5's	2,650,000	—	104½	105
Jackson Gas Co.	250,000	50	82	—
" 1st Mtg. 5's	290,000	1,000	97	100
Kansas City Gas Light Co., of Missouri	5,000,000	100	—	86
Bonds, 1st 5's	3,822,000	1,000	102	104
Laclede Gas Co., St. Louis	10,000,000	100	104¾	105
Preferred	2,500,000	100	94¾	102
Bonds	10,000,000	1,000	102½	103
Lafayette Gas Co., Ind.	1,000,000	100	—	60
Bonds	1,000,000	1,000	60	65
Louisville	2,570,000	50	143	145
Madison Gas and Electric Co. " 1st Mtg. 6's	400,000	1,000	106	108¾
Massachusetts Gas Companies, of Boston	25,000,000	100	91⅝	91¾
Preferred	25,000,000	100	96⅞	97⅜
Montreal Gas Co., Canada	2,000,000	100	218	218¾
Nashville Gas Light Co.	1,000,000	100	110	—
Newark, N. J., Con. Gas Co.	6,000,000	—	56	58
Bonds, 6's	6,000,000	—	137	138
New Haven Gas Co.	2,000,000	25	200	—
Peoples Gas Lt. & Coke Co., Chicago	25,000,000	100	105½	106
1st Mortgage	20,100,000	1,000	—	—
2d "	2,500,000	1,000	104	—
Rochester Gas & Electric Co.	2,150,000	50	88	—
Preferred	2,150,000	50	118	—
Consolidated 5's	2,000,000	—	104¾	105½
San Francisco Gas Co., Cal.	15,500,000	—	—	—
St. Joseph Gas Co.—1st Mtg. 5's	1,000,000	1,000	100	102
St. Paul Gas Light Co.	2,500,000	100	—	—
1st Mortgages, 6's	650,000	1,000	104	108
Extension, 6's	600,000	1,000	112½	115
General Mortgage, 5's	3,447,000	1,000	97	98
Syracuse Gas Co., N. Y.	1,975,000	100	50	55
Bonds	2,047,000	1,000	101	103
Washington (D. C.) Gas Co.	1,600,000	200	410	412½
1st Mortgage, 6's	600,000	—	—	—
Western Gas Co., Milwaukee	4,000,000	—	—	—
Wilmington (Del.) Gas Co.	600,000	50	361	—

MEETING TIMES OF THE VARIOUS GAS ASSOCIATIONS.

American Gas Institute.—Annual meeting, October 18, 19, 20, 21, 1911. St. Louis, Mo. Officers: President, Donald McDonald, Louisville, Ky. Secretary, A. B. Beadle, 29 West 39th st., N. Y. City.

Canadian Gas Association.—Annual meeting, June, 15, 16, 17, 1911. Quebec City, Quebec. Officers: President, Arthur Hewitt, Toronto, Ont.; Secretary and Treasurer, John Keillor, Hamilton, Ont.

Empire State Gas and Electric Association.—Annual meeting, Nov., 1911. New York City. Officers: President, C. R. Huntley, Buffalo, N. Y.; Secretary, C. H. B. Chapin, 20 W. 39th street. New York City.

Guild of Gas Managers of New England.—Annual meeting, March. Young's Hotel, Boston; monthly meeting, second Saturday. Officers: President, Walter G. Africa, Manchester, N. H.; Secretary, H. K. Morrison, Brockton, Mass.

Illinois Gas Association.—Annual meeting, time, March, Chicago, Ills. Officers: President, C. B. Strohn, Elgin, Ills.; Secretary-Treasurer, F. E. Newberry, Dixon, Ills.

Illuminating Engineering Society.—Annual meeting, Oct., Chicago, Ill., 1911. Meetings of Sections, monthly. Pres't, A. E. Kennelly, Boston, Mass.; Secretary, Preston S. Millar, 29 W. 39th street, N. Y. City. Sections: New York: Secretary, Albert J. Marshall, 36 West 39th street. New England, Secretary, W. S. Farrow, 1290 Massachusetts avenue, Cambridge, Mass. Philadelphia, Secretary, G. B. Muth, 1000 Chestnut street Chicago, Secretary, F. H. Bernhard, Marquette Building.

Indiana Gas Association.—Annual meeting, Jan. 17 and 18, 1912, Indianapolis. Officers: President, S. E. Mulholland, Fort Wayne; Vice-President, Howard L. Olds, Indianapolis; Secretary-Treasurer, Philmer Eves, Indianapolis.

Iowa District Gas Association.—Annual meeting, time, May, ——, 1912; Clinton, Ia. Officers: President, Austin Burt, Waterloo, Ia.; Secretary and Treasurer, G. I. Vincent, Des Moines, Ia.

Kansas Gas, Water and Electric Light Association.—Annual meeting, time, —— Wichita, Kas. Officers: President, W. A. Scothorn, Hutchinson, Kas.; Secretary and Treasurer, J. D. Nicholson, Newton, Kas.

Michigan Gas Association—Annual meeting, time, Sept. 20, 21, 22, 1911; Detroit, Mich. Officers: President, A. P. Ewing, Detroit, Mich.; Secretary-Treasurer, Glenn R. Chamberlain, Grand Rapids, Mich.

Missouri Electric Light, Gas, Water Works and Street Railway Association.—Annual meeting, April, 1912; St. Louis, Mo. Officers: President, F. E. Murray, Louisiana, Mo.; Secretary and Treasurer, N. J. Cunningham, Springfield, Mo.

National Commercial Gas Association.—Annual meeting, October 23-28, 1911. Denver, Officers: President, C. N. Stannard, Denver; Secretary, Louis Stotz, 29 West 39th street, New York City.

Natural Gas Association.—Annual meeting, ——————; Pittsburgh, Pa. Officers: President, John M. Garard, Columbus, O. Secretary, T. C. Jones, Delaware, O. Editor Wrinkle Department, F. W. Stone, Ashtabula, O.

New England Gas Association.—Annual meeting, third Wednesday in February, 1912. Boston. Officers: President, J. A. Coffin, Gloucester, Mass.; Secretary-Treasurer, N. W. Gifford, East Boston, Mass.

Ohio Gas Association.—President, John M. Garard, Columbus, O.; Secretary-Treasurer T. C. Jones, Delaware, O.

Oklahoma Public Utilities Association.—Annual meeting, ——————. Officers: President, E. C. Reynolds; Secretary, Galen Crow, Guthrie, Okla.

Pacific Coast Gas Association.—Annual meeting, Sept. 20, 21 and 22, 1911, Oakland, Cal. Officers: President, F. A. Leach, Jr., Oakland, Cal.; Vice President, W. Baurhyte, Los Angeles, Cal.; Secretary-Treasurer, John A. Britton, 445 Sutter street, San Francisco, Cal.

Pennsylvania Gas Association.—Annual meeting, April, 1912, Williamsport, Pa. Officers President, C. W. Butterworth, Milton, Pa; Secretary-Treasurer, William H. Merritt, Lebanon, Pa.

Society of Gas Lighting.—Annual meeting, December, 1911; monthly meeting, second Thursday. Place, New York City. Officers: President, Fred. S. Benson; Secretary, George G. Ramsdell, 254 West 39th street, New York city.

Southern Gas Association.—Annual meeting, April, 1912, Jacksonville, Fla. Officers: President, H. B. Hoyt, Jacksonville, Fla.; Secretary-Treasurer, E. D. Brewer, Atlanta, Ga.

Southwestern Electrical and Gas Association.—Annual meeting. April 27, 28, 29, 1911; Houston, Tex. Officers: President, W. B. Tuttle, San Antonio, Tex.; Secretary, D. G. Fisher, Dallas, Tex.

Wisconsin Gas Association.—Annual meeting, May ——, 1912, Milwaukee, Wis. Officers: President, W. H. Winslow, Superior, Wis.; Secretary-Treasurer, Henry Harmon, Milwaukee, Wis.

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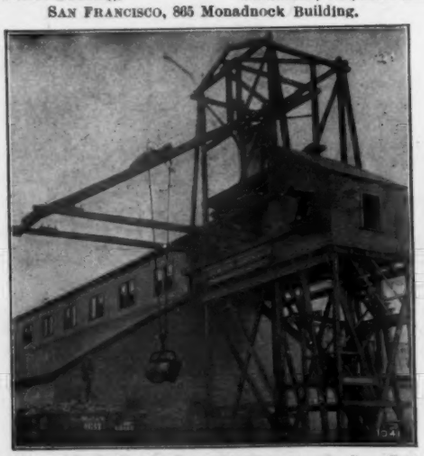

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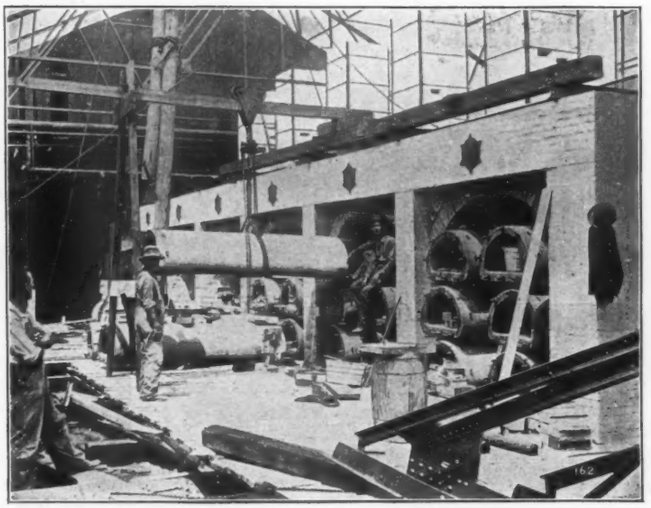

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Day of Week.	MOONLIGHT SCHEDULE.		
	Date.	Light.	Extinguish.
Thursday	1	11.00 P.M.	3.30 A.M.
Friday	2	11.30	3.30
Saturday	3	12.00 F.Q.	3.30
Sunday	4	12.20 A.M.	3.30
Monday	5	12.50	3.30
Tuesday	6	1.10	3.30
Wednesday	7	1.30	3.30
Thursday	8	2.00	3.30
Friday	9	2.20	3.30
Saturday	10	No L.	No L.
Sunday	11	No L. F.M.	No L.
Monday	12	No L.	No L.
Tuesday	13	8.00 P.M.	10.30 P.M.
Wednesday	14	8.00	11.10
Thursday	15	8.00	11.50
Friday	16	8.00	12.20 A.M.
Saturday	17	8.00	12 40
Sunday	18	8.00	1.10
Monday	19	8.00 L.Q.	1.30
Tuesday	20	8.00	1.50
Wednesday	21	8.00	2.20
Thursday	22	8.00	2.50
Friday	23	8.00	3.30
Saturday	24	8.00	3.30
Sunday	25	8.00	3.30
Monday	26	8.00 N.M.	3.30
Tuesday	27	8.00	3.30
Wednesday	28	8.00	3.30
Thursday	29	8.00	3.30
Friday	30	8.00	3.30

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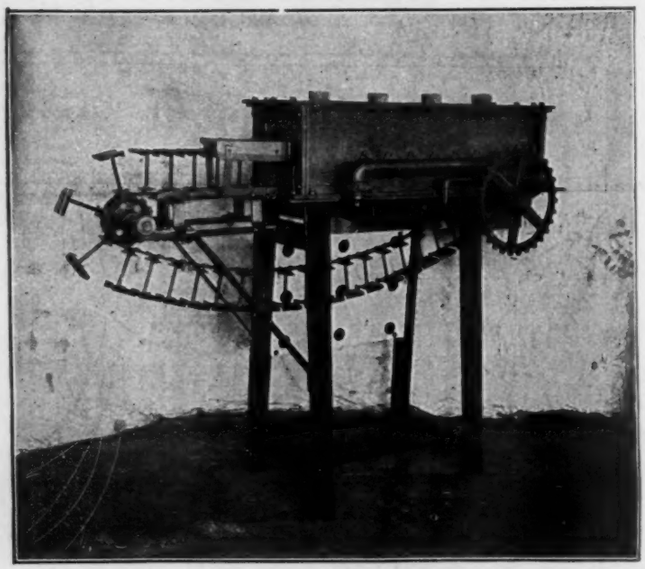

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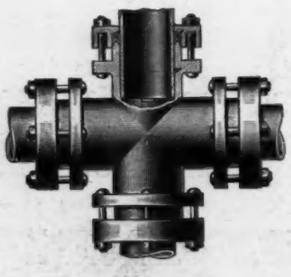

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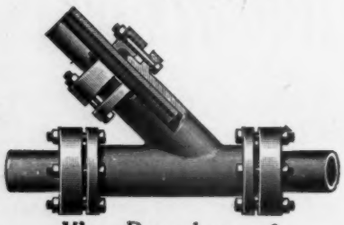

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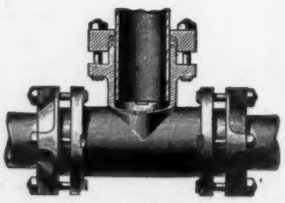

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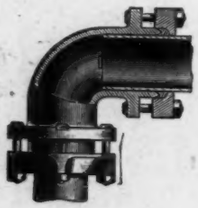

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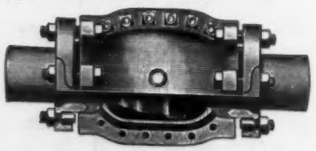

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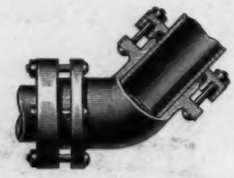

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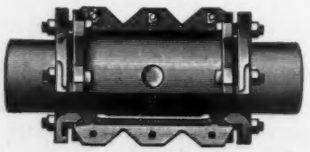

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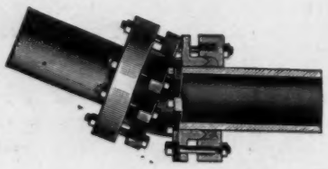

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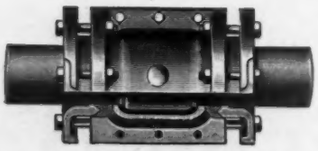

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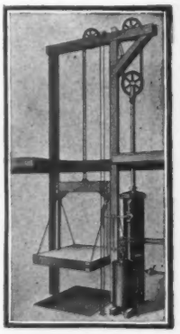

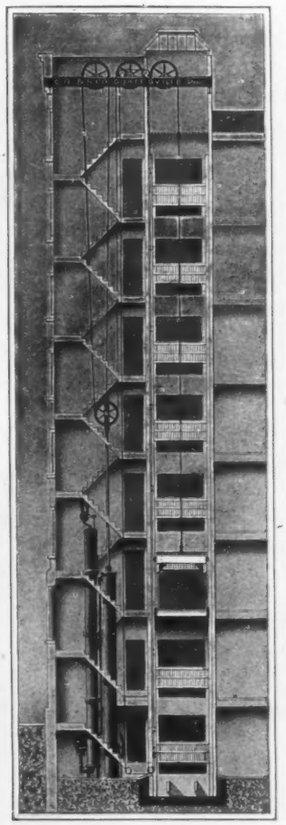

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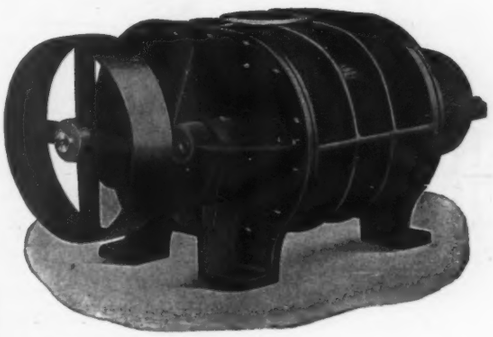

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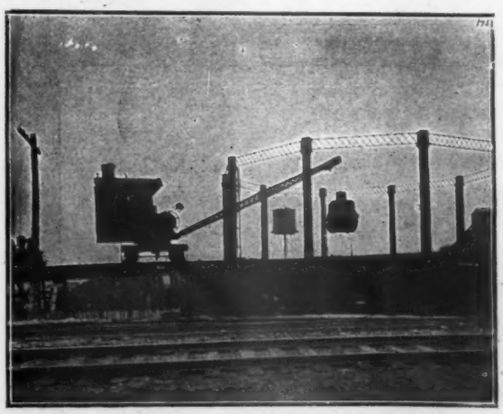

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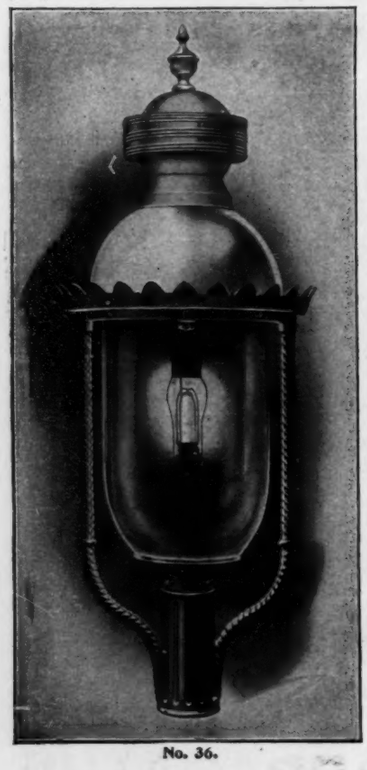

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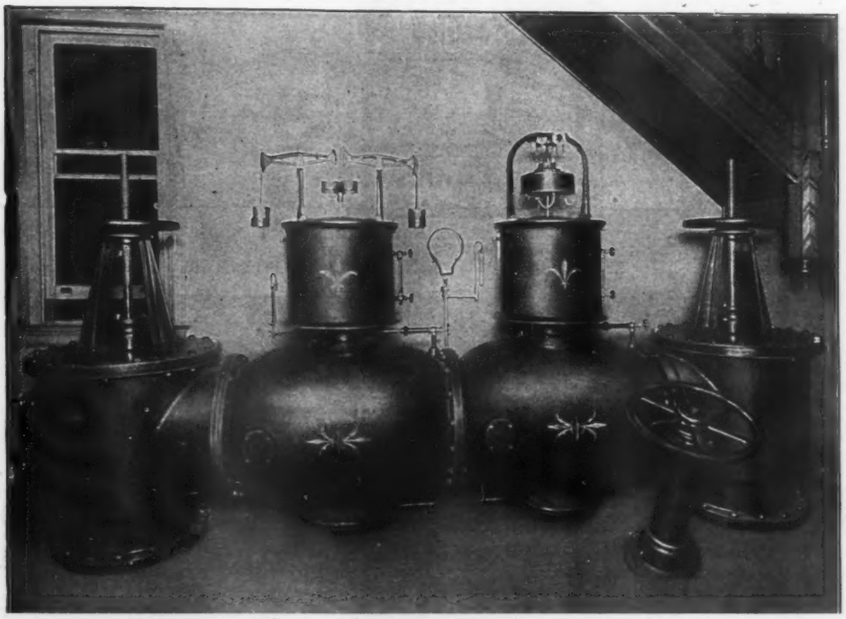

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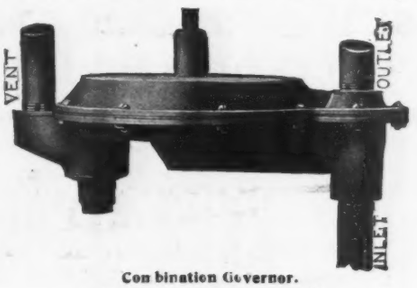

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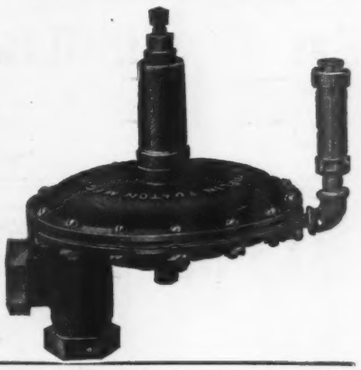

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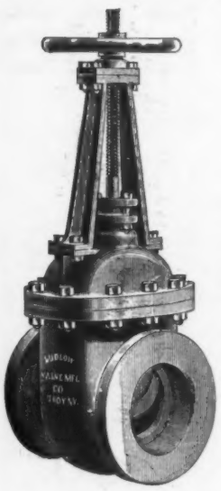

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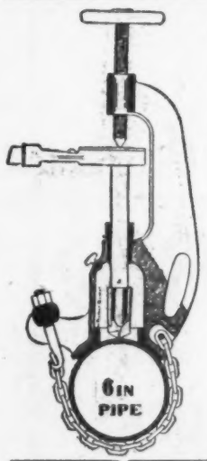

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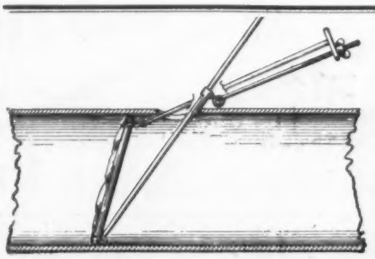

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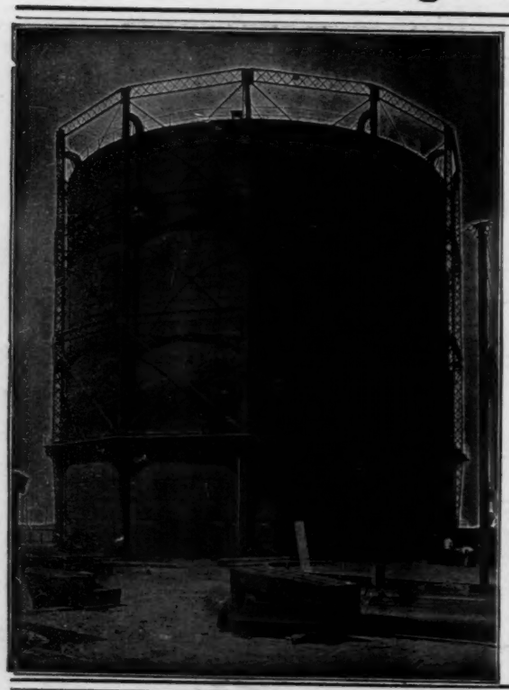

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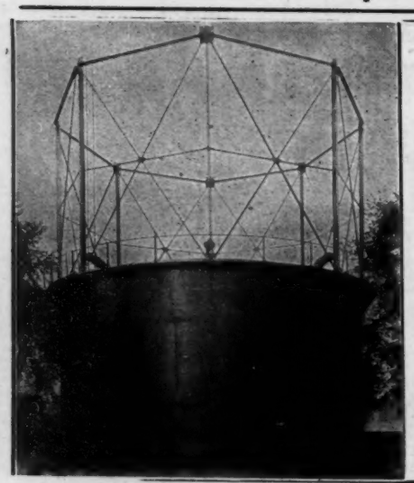

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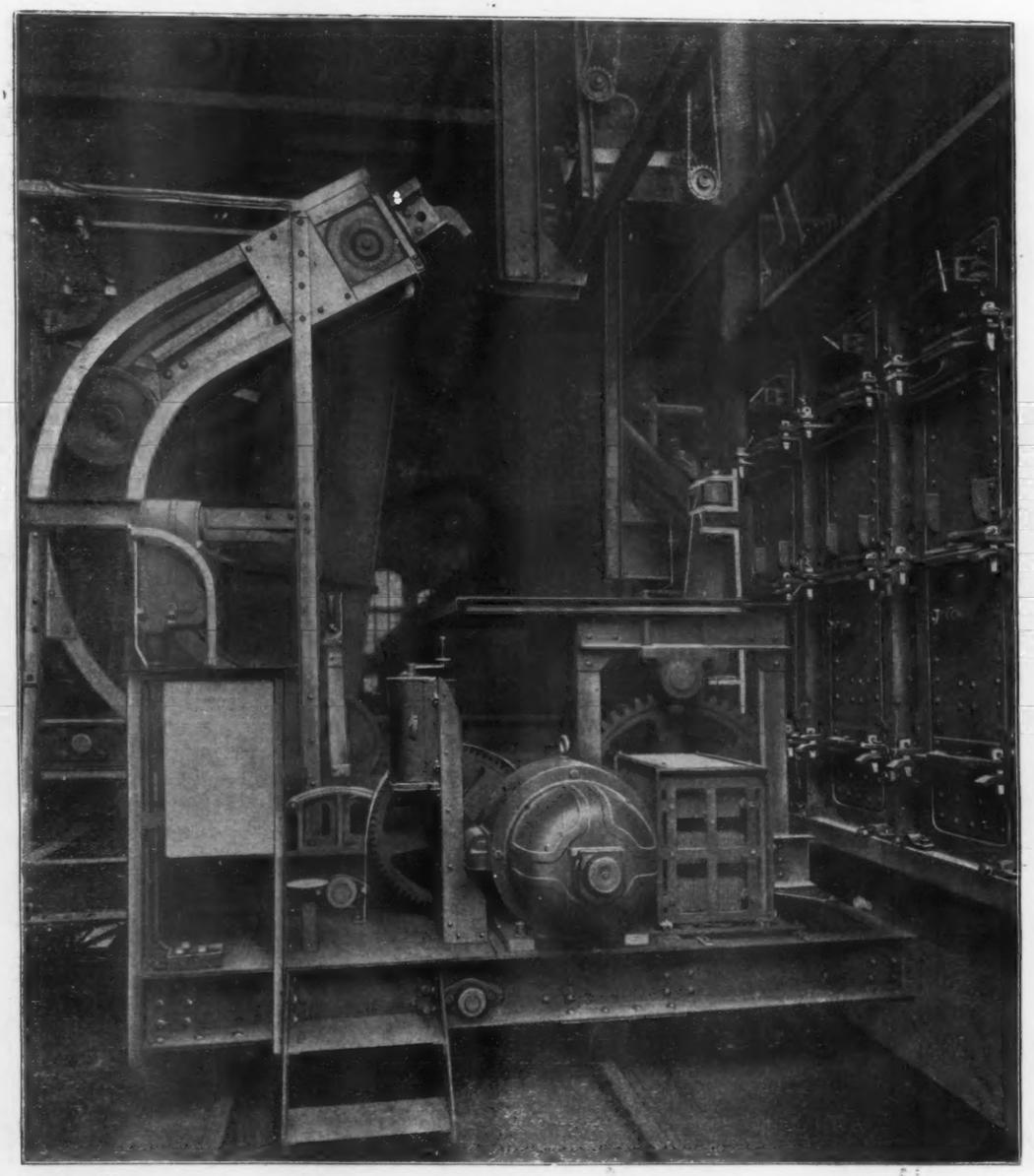

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* Paper by Mr. J. C. Markley.

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"WE AIM TO PLEASE."

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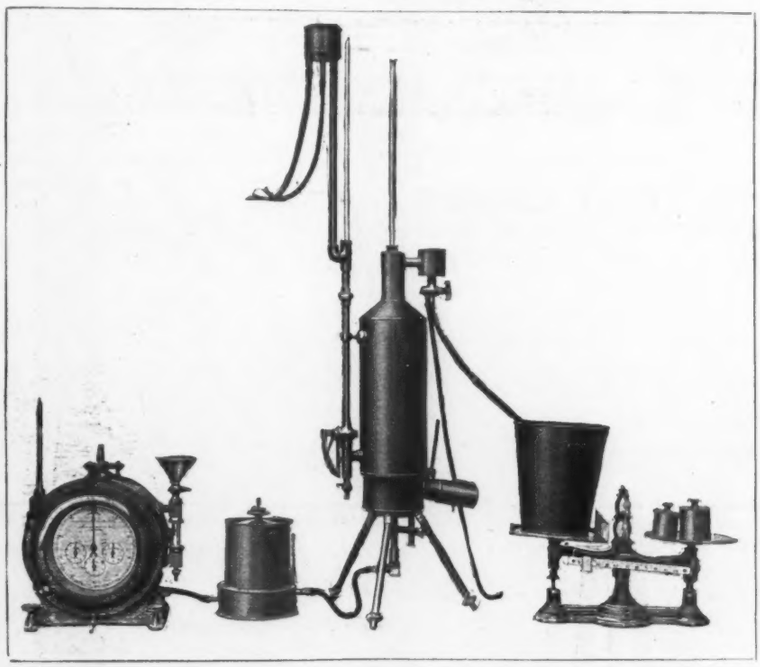

Experimental and Station Meters, Pressure Gauges, Meter Provers, Trip Pumps, Service Cleaner Pumps, Service and Meter Cocks, Lamp Cocks and Torches, Photometrical Apparatus and all articles for the distribution, measurement and testing of gas.

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This Calorimeter, with its accessories, is constructed in accordance with the recommendations made by the Committee on Calorimeters of the American Gas Institute. It also has the approval of the Public Service Commission of the Second District, Albany, and has been found by them to give accurate results.

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FIELD'S ANALYSIS FOR THE YEAR 1909
An Analysis of the Principal Gas Undertakings in England, Scotland and Ireland; being the 41st year of publication. Compiled and arranged by JOHN W. FIELD, Sec'y and Gen. Mgr. of The Gas Light and Coke Company, London. Price, $5. For Sale by AMERICAN GAS LIGHT JOURNAL, 42 Pine St., N. Y. City

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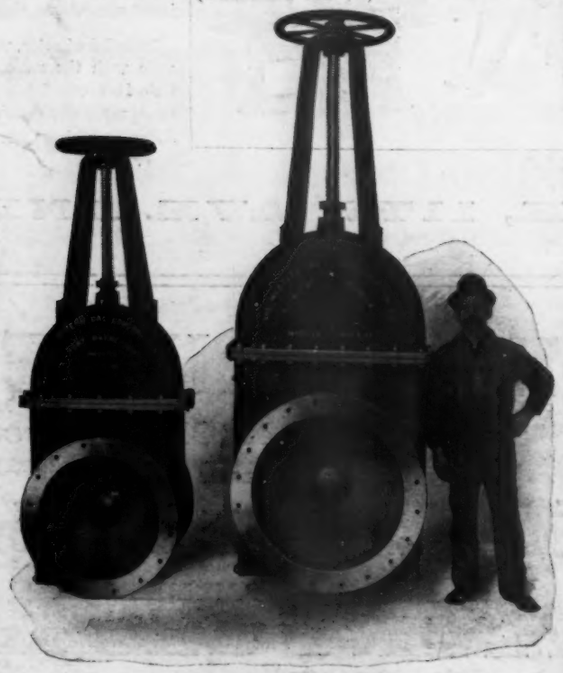
The following list shows in what respect our Valves are held by six representative concerns. In every instance the original order was followed by repeat orders:

	1908.	1909.	1910.	Total.
Westinghouse Machine Co.	. . .	$1,746	$3,085	$4,831
H. Koppers	. . .	. . .	7,095	7,095
U. S. Steel Corporation .	$19,951	353	37,917	58,221
Los Angeles Gas & Elec. Co	. . .	1,808	7,979	9,787
Milwaukee Coke & Gas Co	. . .	3,017	271	3,288
East St. Louis Gas Co. . .	. . .	. . .	2,267	2,267
				$85,489

(There are others.)



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